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Montana Generic Management Plan

MANAGING PESTICIDES TO PROTECT GROUND WATER

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UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
Region VIII
999 18th Street - Suite 500
DENVER, COLORADO 80202-2405

MAR 19 1998

Ref:8MO

Ralph Peck, Director
Montana Department of Agriculture
P.O. Box 200201
Helena, Montana 59620-0201

Re: Generic SMP Concurrence

Dear Director Peck:

This transmittal is to inform you that the U.S. Environmental Protection Agency, Region VIII, is formally concurring on the Montana Generic Groundwater Management Plan (SMP) which was submitted by the Montana Office. With this concurrence, the state has a framework under which the pesticide specific management plan can be developed.

The State of Montana should be congratulated on this excellent endeavor. My staff and I recognize the time and effort that were put into developing the SMP and we appreciate your hard work. We look forward to continuing our cooperation as this plan is implemented. We thank you for your continued commitment to the environment.

Sincerely,

William P. Yellowtail
Regional Administrator

cc: Gary Gingery, MDA
John Wardell, Montana Office

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MONTANA TECH
of The University of Montana

Montana Bureau of Mines and Geology
1300 West Park Street
Butte, Montana 59701-8997
(406) 496-4180

February 24, 1998

Mr. William P. Yellowtail
EPA Region VIII Administrator
999 18th St.
Suite 500
Denver CO 80202-2466

RE: Letter of concurrence for the Montana Ground Water and Pesticides Generic Management Plan

Dear Mr. Yellowtail:

The purpose of this letter is to provide acknowledgment of the Montana Ground Water and Pesticides Generic Management Plan. We have reviewed the Generic Management Plan and we concur with the agency descriptions and with the PSMP development and implementation roles and responsibilities as described in Component 2 of the document.

The Montana Bureau of Mines and Geology enjoys a good working relationship with the Montana Department of Agriculture (MDA) and expects to continue to provide technical information to the MDA, as requested.

Sincerely,

Dr. John Steinmetz
Director and State Geologist
Montana Bureau of Mines and Geology
cc: Donna Rise, Montana Department of Agriculture
File

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DEPARTMENT OF NATURAL RESOURCES AND CONSERVATION

MARC RACICOT, GOVERNOR

1625 ELEVENTH AVENUE

STATE OF MONTANA

DIRECTOR'S OFFICE (406) 444-2074
TELEFAX NUMBER (406) 444-2684

PO BOX 201601
HELENA, MONTANA 59620-1601

February 23, 1998

Mr. William P. Yellowtail, Administrator
EPA Region VIII
999 18th St., Suite 500
Denver Co. 80202-2466

Dear Mr. Yellowtail

The Montana Department of Natural Resources and Conservation has numerous programs that protect and improve Montana's surface and ground water. As a result, it is important that this agency be involved in the Pesticide Specific Management Plan.

I have reviewed the Ground Water and Pesticides Generic Management Plan. I have found the agency description accurate, and the roles and responsibilities acceptable, provided adequate resources are available for implementation.

Sincerely,

Bud Clinch

Bud Clinch
Director

cc: Donna Rise

DEPARTMENT OF ENVIRONMENTAL QUALITY

MARC RACICOT, GOVERNOR

STATE OF MONTANA

(406) 444-2544

PO BOX 200901
HELENA, MONTANA 59620-0901

February 25, 1998

William P. Yellowtail
Office of the Regional Administrator
Region V111
Environmental Protection Agency
999 18th Street Suite 500
Denver, CO 80202-2466

Dear Mr. Yellowtail: Bill

The Department of Environmental Quality(DEQ) has reviewed the 1998 Generic Pesticide Management Plan for Montana. The Department believes the plan accurately describes the DEQ's roles, abilities, and responsibilities for the prevention and control of water pollution caused by pesticides.

The Department concurs with the plan and thinks it is an important part of Montana's water pollution control efforts.

Sincerely,

Mark Simonich

MARK SIMONICH
Director

cc: Dept. of Agriculture

MONTANA STATE UNIVERSITY
BOZEMAN

College of Agriculture
Agricultural Experiment Station
Office of the Dean and Director
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Bozeman, MT 59717-2860
406-994-3681 FAX: 406-994-6579
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February 20, 1998

Mr. William P. Yellowtail
EPA Region VIII Administrator
999 18th Street, Suite 500
Denver, CO 80202-2466

Dear Mr. Yellowtail:

The Montana Agricultural Experiment Station (MAES) and Extension Service does support the protection of ground water within the state of Montana, and does agree to the roles and responsibilities as outlined in the Generic Ground Water and Pesticides Management Plan, provided adequate resources are available for implementation.

Our agencies agree to provide continued representation on the Working Committee.

Sincerely,

Thomas J. McCoy
Dean and Director
College of Agriculture/MAES

Charles Rust
Interim Director
Extension Service

United States Department of the Interior

U.S. GEOLOGICAL SURVEY
Water Resources Division
Federal Building, Room 428
301 South Park Avenue, Drawer 10076
Helena, Montana 59626-0076

February 23, 1998

Ms. Donna Rise
Montana Department of Agriculture
Agricultural Services Division
303 N. Roberts, PO Box 200201
Helena, MT 59620-0201

Donna

Dear ~~Ms. Rise~~,

We have reviewed the Montana Ground-Water and Pesticides Generic Management Plan and concur with the approach and objectives. The roles and responsibilities of the USGS described in this plan are consistent with the mission of USGS, Water Resources Division in Montana. We are glad to be involved in this important effort to protect Montana's water resources from pesticide contamination.

Sincerely,

Bob

Robert E. Davis
District Chief

nited States
Department of
Agriculture

tural
Resources
Conservation
rvice

Federal Building
Room 443
0 East Babcock
zeman, MT
9715-4704

February 23, 1998

William P. Yellowtail, Administrator
EPA Region VIII
999 18th St., Suite 500
Denver, CO 80202-2466

Dear Mr Yellowtail,

I have reviewed the Montana Generic Management Plan, and find that the description of our agency is accurate, and I concur with and fully accept the roles and responsibilities that are outlined in the Plan.

SHIRLEY GAMMON
State Conservationist

cc: Ken Kaul, State Resource Conservationist, NRCS, Bozeman, MT
Donna Rise, Ground Water Specialist, MDA, Helena, MT

Preface

The central goal of EPA's Pesticides and Ground Water Strategy (October 1991) is to provide States with flexibility in the protection of ground water resources and management of agricultural chemicals. Part of this strategy is the development of Pesticide Specific Management Plans for those agricultural chemicals having the potential to impair ground water resources by states who wish to continue their use. Prior to the development of Pesticide Specific Management Plans, EPA has encouraged states to develop a Generic Management Plan. The purpose of the Generic Management Plan is to serve as the basis from which Pesticide Specific Management Plans can be developed. When EPA designates, by rule, specific pesticides requiring a management plan for continued use, the state will develop a pesticide specific management plan based on EPA's 12 key elements of concern. In this way, the Generic Management Plan becomes a template for all Pesticide Specific Management Plans.

Much of the material found in the Montana General Agricultural Chemical Ground Water Management Plan was used in the development of the Generic Management Plan. A listing of the agencies that participated in the development of the Montana General Agricultural Chemical Ground Water Management Plan may be found in Appendix A of component 10. The information for the Generic Management Plan conforms to the twelve component requirements specified by EPA in the Pesticides and Ground Water Strategy.

Acknowledgements

W. Ralph Peck, Director of the Montana Department of Agriculture, and Gary Gingery, Administrator of the Agricultural Sciences Division of the Department would like to thank the following departmental employees for their diligence, assistance and expertise in completing this plan.

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The Montana Department of Agriculture would like to thank Carolyn Demartino, John Arrigo and Abe Horpestad, Montana Department of Environmental Quality; John Kilpatrick, United States Geological Survey; Kate Miller, Montana Bureau of Mines and Geology; Jeff Jacobsen, Montana State University Agricultural Experiment Station and Extension Service; Bud Clinch and Kirk Waren, Montana Department of Natural Resources and Conservation; Ken Kaul, United States Natural Resource Conservation Service and Jennifer Wintersteen, EPA, Helena Office for their expertise and assistance.

Much of the material found in the Montana General Agricultural Chemical Ground Water Management Plan was used in the development of the Generic Management Plan. Appendix A of Component 10 lists the agencies and organizations who participated in the development of the Montana Agricultural Chemical Ground Water Management Plan.

Montana Generic Management Plan

Table of Contents

Preface
Acknowledgments
Introduction I

Component 1: Philosophy and Goals
Ground Water To Be Protected & Degree of Protection To Be Provided 1.1
Prioritization of State Management Plans 1.1
Reference Points and Health Related Standards 1.1

Component 2: Roles and Responsibilities
Agencies With Statutory Responsibility For Development and Implementation of Pesticide Specific Management Plans 2.1
Coordination Mechanism 2.1
Local Units of Government 2.2
Liaison 2.3
Description of Agencies and Organizations Having Responsibilities For Ground Water Education, Research, Data Collection, and Enforcement In Montana ... 2.3
Federal Agencies
Environmental Protection Agency 2.3
Natural Resource Conservation Service 2.4
United States Department of Agriculture-Agriculture Research Service 2.5
United States Department of Agriculture-Farm Services Agency 2.6
United States Geological Survey 2.6
State Agencies
Montana Department of Agriculture 2.7
Montana Department of Environmental Quality 2.9
Montana Department of Natural Resources and Conservation 2.11
Montana Bureau of Mines and Geology 2.12
Montana State University 2.13
Montana State University Extension Service 2.14
Montana State Library-Water Information System 2.15
Local Agencies
Conservation Districts 2.15
Others
Montana Salinity Control Association 2.16
Agriculture Grower and Related Groups 2.17
Local Units of Government 2.17
Pesticide Registrants 2.17
Plan Concurrence 2.18

❧ Component 3: Legal Authority

General Legal Authority To Regulate Pesticides and Protect Ground Water 3.1
Federal
The Federal Insecticide, Fungicide and Rodenticide Act 3.1
The Clean Water Act 3.1
The Safe Drinking Water Act 3.2
The Resource Conservation and Recovery Act 3.2
The Comprehensive Environmental Response, Compensation And Liability Act 3.2
Toxic Substances Control Act of 1976 ..... 3.2
State
Montana Agricultural Chemical Ground Water Protection Act 3.2
Montana Pesticide Act 3.3
Montana Water Quality Act 3.4
Montana Solid Waste Management Act 3.5
Montana Comprehensive Environmental Cleanup and Responsibility Act 3.5
Montana Water Use Act 3.6
Montana Ground Water Assessment Act 3.6
Montana Hazardous Waste and Underground Storage Tank Act 3.6
Legal Authority to Develop and Implement Management Plans 3.6
Federal 3.6
State
Development 3.6
Implementation 3.8
Emergency Situations 3.9
Compliance of Management Plans 3.9
Evaluation and Modifications to Management Plans 3.9
Modifications in Authority Needed to Enhance the PSMP Process 3.9

❧ Component 4: Resources

Technical Expertise 4.1
Montana Department of Agriculture 4.1
Montana Department of Environmental Quality 4.2
Montana Department of Natural Resource and Conservation 4.2
Montana Bureau of Mines and Geology 4.3
Montana State University and Montana State University Extension Service ... 4.3
Natural Resource Conservation Service 4.4
United States Geological Survey 4.4
Anticipated Costs for a PSMP 4.4
Funding 4.5

❧ Component 5: Assessment and Planning
Initial Assessment 5.1
Sources of Information 5.2
Assessment and Planning Limitations 5.5

❧ Component 6: Monitoring Program
Objective 6.1
Scope 6.1
Design and Justification 6.1
Monitoring Protocols 6.3
Baseline Monitoring 6.3
Response Monitoring 6.3
Evaluative Monitoring 6.5
Quality Assurance/Quality Control 6.5
Quality Assurance Plan 6.5
Documentation of Physical Samples For Evidence 6.6
Laboratory Operations 6.6
Laboratory Quality Assurance Project Plan 6.6
Analytical Methods 6.6
Sampling Procedures 6.11
Monitoring Results 6.11

❧ Component 7: Prevention and Management Measures
Prevention Level A 7.2
Prevention Level B 7.3
Prevention Level C 7.4
Prevention Level D 7.5
Plan Evaluation 7.5
Preventive Measurement Rationale and Descriptions 7.6
Education and Training 7.6
Communication and Outreach 7.7
Risk Reduction Measures 7.8
Compliance & Technical Assistance 7.9
Pesticide Classification 7.9
Pesticide Usage 7.10
Permitting and Individual Plan Development 7.11
Monitoring 7.12
Alternative Water Supplies 7.12

❧ Component 8: Response to Detections of Pesticides
Verification 8.1
Notification 8.1
Expanded Sampling 8.1
Investigation 8.1
Monitoring Results from Other Agencies 8.2
Response When Verified Pesticide Detections In Ground Water Are Less Than the Standard 8.2
Response When Pesticide Detections Are In Exceedence Of Standards 8.4
Remedial Responses 8.4

❧ Component 9: Enforcement
Authority 9.1
Enforcement Strategies 9.1
Enforcement of PSMPs 9.3
Emergency Actions 9.4
Compliance Orders 9.4
Civil Penalties 9.4
Criminal Penalties 9.4
Coordination Of Enforcement Activities 9.5

❧ Component 10: Public Awareness and Participation
General Public Awareness and Participation Provisions 10.1
Generic Management Plan 10.2
Pesticide Specific Management Plans 10.2
Appendix A: Public Participation in the Generic Management Plan ..... Ai

❧ Component 11: Information Dissemination
Generic Management Plan 11.1
Pesticide Specific Management Plans 11.1
Plan Distribution 11.1
Public Meetings 11.1
Education and Training 11.2
Registrants and Dealers 11.2
Pesticide Applicator and Dealer Inspections 11.2
Information and Data Dissemination 11.2
PSMP Modification and/or Changes 11.3

❧ Component 12: Records and Record Keeping
Programmatic 12.1
Environmental 12.2

Acronyms

Introduction

Montana is ranked second in the nation for total acres of land in farms and ranches. Montana also ranks in the nation's top five in several livestock and crop production categories, including beef cattle, sheep, wheat, barley, and oats. In addition, Montana plays an important role in the production of such alternative crops as canola, safflower, and mint. The State also produces alfalfa, other forages, and potatoes. In several regions of Montana, weather conditions allow for the growing of fruits such as apples and sweet cherries.

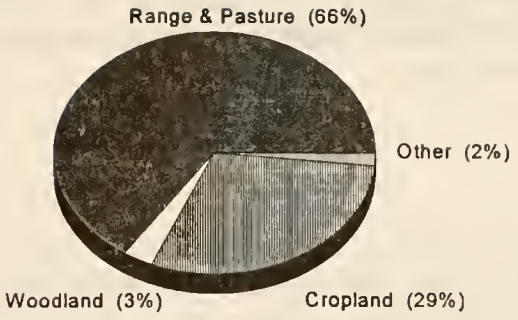

Figure 1.1 Percentage of Land In Farms & Ranches in Montana (MDA, 1997)

Of the total land (93 million acres) in Montana, 59.7 million acres (MDA, 1997) are in farms and ranches. Of that 59.7 million acres, 29.3 percent (17.5 million acres) is cropland (Figure 1.1). Seven and one-half (7.5) million of those acres in cropland production are in small grain production (wheat, barley, oats)(MDA, 1992). Montana ranks 4th among states in wheat production. The remainder of the land is in summer fallow, hay, corn, sugar beets, apples, buckwheat, canola, cherries, potatoes, dry beans, field peas, flax, grapes, garlic, lentils, safflowers, sunflowers, mustard, corn, rapeseed, mint, kabocha squash, christmas trees and other alternative or specialty crops. Montana also ranks 8th in honey, 6th in sugar beets and 8th in alfalfa hay production. Agricultural pesticide use in Montana is as diverse as its agriculture.

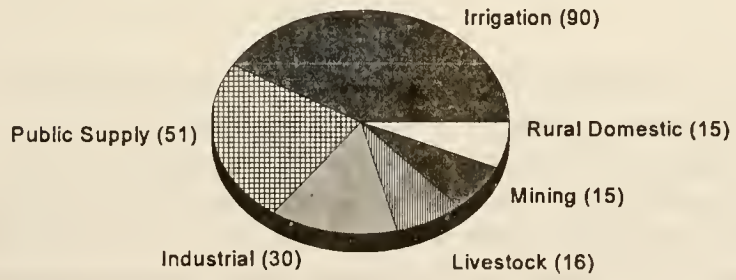

Figure 1.2 Estimated ground water withdrawls in Montana in 1991 (in nearest 1 mgd) (USGS, 1993)

Montana relies heavily on water resources for agriculture, recreation and human consumption (Figure 1.2). Ground water is an important source of this supply. Ground water supplies over half of the state's drinking water. In rural areas, ground water accounts for 95% of the water consumed. Agriculture, as an industry, is dependent on ground water for irrigation and stock water. Many of the streams and several of the state's cold-water fish hatcheries also rely heavily on ground water. All of these uses make Montana's ground water a vitally important resource.

At the state level, the Montana Agricultural Chemical Ground Water Protection Act (MACGWPA) mandates the protection of ground water resources through the management of agricultural chemicals. Under the MACGWPA, management plans are identified as an important tool in achieving those objectives. At the federal level, EPA has established partnerships with states in

ground water resource protection. The EPA-state partnership approach represents a new philosophy whereby states will be assuming the lead role in protecting ground water resources through development and implementation of management plans. State and federal management plans have similar goals.

Philosophy and Goals

The **philosophy** toward protecting Montana ground water is to protect all ground water resources from impairment by agricultural chemicals; pesticides and commercial fertilizers. The use of agricultural chemicals will be managed in such a way as to prevent, minimize and mitigate their presence in ground water and surface waters having a hydrological connection with ground water resources. The **goals** for protecting Montana ground water are:

1. To protect existing beneficial uses and potential future beneficial uses of all ground water from impairment by agricultural chemicals;
2. To maintain the quality of Montana's ground water as it naturally exists;
3. To give priority to ground water resources having a naturally high beneficial drinking water potential or to those that are considered sole source drinking water aquifers.

The philosophy and goals are reflected in the *Montana Agricultural Chemical Ground Water Protection Act (MACGWPA) (80-15-101 et seq., Montana Codes Annotated, (MCA)).* The Act provides for the protection of ground water and the management of agricultural chemicals to prevent impairment of Montana's water resources.

Ground Water To Be Protected & Degree Of Protection To Be Provided

It is the intent of the state of Montana to protect all ground water resources and surface waters determined to have a hydrogeological connection with ground water. The degree of protection will be based on the naturally existing condition and, where classified by the DEQ, by the classification of that water. Ground and surface water classification in Montana is designed to protect current and future beneficial uses. Priority will be given to ground water having a naturally high beneficial drinking water potential or to ground water serving as sole source aquifers which provide drinking water. This will include both existing and future potential beneficial uses.

Prioritization of State Management Plans

The MDA will base prioritization of specific agricultural chemical ground water management plans on the specific circumstances of each area and within available resources (80-15-212(3), MCA).

Reference Points And Health Related Standards

The MACGWPA requires that standards and, as applicable, interim numerical standards for agricultural chemicals be adopted to protect ground water. A "standard" is defined in 80-15-201, MCA to mean the numerical value expressing the concentration of an agricultural chemical in ground water that, when exceeded, presents a potential human health risk over a lifetime of consumption and that is adopted by a rule of the Montana Board of Environmental Review as required by 80-15-201, MCA. An "interim numerical standard" (INS) is defined in 80-15-201, MCA as a health-based number that expresses the concentration of an agricultural chemical allowed in ground water that is adopted by rule of the Montana Board of Environmental Review pursuant to 80-15-201(3) or (4), MCA. The Board of Environmental Review is responsible for adoption of standards and interim numerical standards for agricultural chemicals as required by 80-15-201, MCA. Adopted standards (Maximum Contaminant Levels (MCLs) and Health Advisories (HAs)) must be at least as protective as promulgated or nonpromulgated federal standards as established under the Safe Drinking Water Act (SDWA) or other federal regulations. When adopting INSs, the Board may establish and adopt a value that differs from those established by EPA or where none has been established by EPA if there is significant new and relevant technical information available that is scientifically valid. The Board must review the INS when EPA either establishes or revises the federal standard for the agricultural chemical in question. Under PSMPs, established and adopted MCLs, HAs, and INSs will be used.

In addition to MCLs, HAs and INSs, the MDA and DEQ will use the response levels described in the MACGWPA (80-15-212, MCA) in evaluating monitoring and sampling to determine the appropriate response to detection of agricultural chemicals in ground water.

Cited References

Montana Department of Agriculture. 1997. Snapshots of Montana Agriculture. Brochure. Montana Department of Agriculture, Agriculture Development Division, Helena, Montana.

Montana Department of Agriculture, et al. 1971-1992; yearly publication issues from 1971 through 1992. Montana Agricultural Statistics. Montana Department of Agriculture and Montana Crop and Livestock Reporting Service, Helena, MT.

USGS. 1993. Provisional data. Unpublished. USGS, Helena, MT.

Roles and Responsibilities

Agencies With Statutory Responsibility For Development and Implementation of Pesticide Specific Management Plans

While there are many agencies involved in ground water protection, the MDA and the DEQ are the two agencies primarily involved in ground water protection through the management of agricultural chemicals. MDA and DEQ coordinate their efforts to maximize ground water protection efforts and to avoid duplication of activities.

The MDA and DEQ, jointly, are required to conduct monitoring to determine ground water quality, assess the presence of agricultural chemicals in ground water, determine the vulnerability and sensitivity of Montana aquifers, and evaluate the effectiveness of management plans implemented for the protection of ground water resources.

The DEQ is responsible for adoption of water quality standards and for providing comment to the MDA during the development of agricultural chemical ground water management plans. This included development of the Montana GMP. The MACGWPA required the development of the Montana GMP by the MDA. For more detail concerning the development of this plan, see component 10, Appendix A. Because much of the material contained within the Montana GMP satisfied the requirements for the EPA GMP, Montana GMP materials were used in developing the EPA GMP.

Coordination Mechanism

All management plans will be developed to compliment other ground water protection plans and programs on the local, state, and federal level. When one or more ground water plans or programs are likely to be in effect in a particular area, coordination between the agencies involved will be specified and defined in the pesticide specific management plan (PSMP). Careful review of existing and proposed plans/programs will be conducted to avoid overlap and duplication of effort. The MDA will work with the Natural Resource Conservation Service (NRCS) to coordinate pesticide specific management plans and conservation compliance plans developed under the Food Security Act of 1985.

When developing a pesticide specific management plan, the MDA will create a team of professionals from the Montana Department of Agriculture (MDA), Montana Department of Environmental Quality (DEQ), Montana Department of Natural Resources and Conservation (DNRC), Montana Bureau of Mines and Geology (MBMG), United States Geological Survey (USGS), Natural Resources Conservation Service (NRCS), Montana State University Extension

Service (MSU ES) and Agricultural Experiment Stations (MSU AES), and the Environmental Protection Agency (EPA), Montana Office. The team's responsibility will be to assess all data, information and studies available for the particular geographical area where a management plan is proposed and to assess the information and data needs as well as the expertise needed or desired to develop and implement an effective management plan. The team will also be responsible for making recommendations for plan development and implementation. Under the Administrative Rules of Montana, ARM 4.11.401, the MDA may also form PSMP advisory committees to assist in the development and implementation of PSMPs. PSMP advisory committee members will include identified experts determined by the team to be necessary or desirable and representatives of local, state and federal agencies, pesticide registrants, producers and other interest groups and/or individuals. Members will be responsible for assuring the proposed PSMP does not conflict with other program requirements and integrating PSMPs into existing programs.

Local Units of Government

When development of management plans in a specific area will impact or affect individuals, groups, communities, or large geographical areas, local involvement will be encouraged and actively sought. At the very least, individuals, groups and communities upon which management plan activities and restrictions may be imposed will be identified within the plan and notified in writing. Written notification may be followed by public meetings to explain the plan and its details, to answer questions and to provide technical and compliance assistance with plan requirements.

Local involvement in ground water protection measures and pesticide regulation are governed by the Montana Water Quality Act and the Montana Pesticide Act, respectively. Under the Montana Water Quality Act, Administrative Rules of Montana, subchapter 5, 17.30.1801 et seq., local governments have the authority to protect water resources. Under such authority, localities have the right to develop local water quality districts. Local governments may design and develop a program to protect, maintain, and improve the quality of state water within the boundaries of a local water quality district when established according to specified procedures. Such plans must be approved by the DEQ but will be administrated, financed, and enforced by the local government. The Helena valley (Lewis and Clark County), Missoula area (Missoula County) and Gallatin and Silverbow Counties have established water quality districts which manage activities for the protection of ground water resources in that locality. Five other cities or counties are considering the development of a local water quality management plan.

Under the Montana Pesticide Act, a unit of local government may adopt an ordinance to require a commercial applicator to provide public notification when applying a pesticide. Local governments may not adopt a notification ordinance which imposes additional fee requirements on a commercial applicator. Local government may also not regulate or prohibit the registration, labeling, distribution, use, or sale of pesticides or enact notification provisions more stringent than those provided for under 80-8-120, MCA. The MDA may enter into a cooperative agreement with a unit of local government for the administration and enforcement of local rules adopted under 80-8-105(3)(a), MCA.

The MDA and the DEQ have a Memorandum of Understanding (MOU) concerning ground water activities and management of agricultural chemicals as they relate to protection of water resources. The MDA does not have MOUs with other agencies specific to ground water protection and management of agricultural chemicals. A MOU or other similar agreement of coordination will be developed when and if it becomes necessary for the effective development, implementation and enforcement of a EPA pesticide specific management plan.

Liaison

The MDA Agricultural Sciences Division (ASD) Administrator will be the designated liaison for all formal communications between the state of Montana and the EPA. The liaison will be the contact point for development and implementation of both the EPA GMP and any PSMP.

Description of Agencies and Organizations Having Responsibilities For Ground Water Education, Research, Data Collection, and Enforcement In Montana

Numerous agencies and organizations at the federal, state, local, and nonprofit level are involved in education, research, and technical support pertaining to Montana's ground water resources. Agencies and organizations listed do not necessarily have a state statutory responsibility with regard to pesticide specific management plans. However, while these agencies do not have statutory responsibility, MDA recognizes the valuable contribution these agencies can provide in direct and/or indirect support of the plans. Because the MDA intends to seek assistance from other agencies and professionals as well as the public when developing management plans, a description of those agencies with responsibility for ground water protection and/or pesticide regulation are included. When appropriate a list of responsibilities felt to be integral to the PSMP process that the agency or organization performs will follow the description. This list is not intended to be an inclusive nor a preferential listing. Rather, this is a list and description of those agencies that responded to the Development and Implementation committee's (Montana GMP) request for information. Sources of useful and valuable information may be available from other organizations. Approaches include awareness, education, research, pollution prevention from point and nonpoint sources, sampling and data collection, and remediation and concern for human health.

Federal Agencies

Federal agencies such as the EPA, United States Geological Survey (USGS), NRCS, and United States Department of Agriculture-Agricultural Research Service (USDA-ARS) provide assistance, guidance, and technical information to the State for incorporation into educational programs that promote the proper use of agricultural chemicals and prevention of ground water impairment by these chemicals.

Environmental Protection Agency (EPA)

Various statutes provide EPA with the authority to 1) control sources of ground water contamination, 2) prevent impairment of ground water resources and 3) pursue ground water resource remediation activities. The EPA establishes ground water policy (direction and program

consistency), coordinates federal, state and local programs, provides wellhead protection guidance to states and addresses sources of impairment using a resource-based approach. Monitoring water resources for chemical and biological parameters assures that minimum health and water quality standards are met. The EPA maintains water supply data on Indian Reservations, while DEQ maintains community water supply data not maintained by EPA. Maintenance of ground water resource data is kept on the Storage and Retrieval System (STORET), the EPA's national information repository. EPA regulates the Underground Injection Control Program to assure minimal chance of aquifer impairment. The EPA also administers the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) which is commonly referred to as the Superfund Program. Authorization is given for the use of federal funds under CERCLA for the restoration of water quality of severely contaminated ground water sources.

In 1984, the EPA began developing the Ground Water Protection Strategy. The strategies are based upon common ground water protection principles that provide for protection of human health and the environment. The EPA's ground water strategy emphasizes the need for state management of ground water resources and for state primacy in ground water protection efforts. It enabled EPA to provide technical and financial assistance under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), Safe Drinking Water Act (SDWA) and Clean Water Act (CWA) to states working toward a comprehensive approach to ground water protection. The principles emphasize prevention of ground water impairment through education and regulatory controls. An important element of the EPA strategy is the development and implementation of PSMPs. In order for certain pesticides to be used (pesticides with the greatest potential to harm ground water resources), the identified pesticides will be registered for use only in states with EPA approved management plans.

EPA's PSMP Role and Responsibilities

1. May act as liaison between and facilitate coordination of management plan efforts between the state and tribal entities, the state and bordering states and the state and Canada where a common border is shared. This includes initiating communication with Canada on ground water protection and pesticide management and promoting development of cooperative agreements and development of advisory committees between Canada and affected states.
2. May act as liaison between and promote cooperation between bordering states, tribes and growers and producers having property crossing state or tribal boundary lines.
3. Provide technical assistance and oversight in development, implementation, enforcement and evaluation of PSMPs.
4. Provide a forum through which unresolved issues between states and regional EPA offices can be addressed.
5. Serve as a member of the Voluntary Advisory Committee.
6. Regulate pesticide registration.
7. Provide regulatory compliance assistance, interpretation and oversight.
8. Administer CWA, FIFRA, SDWA, CERCLA, NEPA, etc. programs.
9. Identify potential funding sources and assist states in securing funding for PSMPs.

Natural Resource Conservation Service (NRCS)

Through the Soil Conservation Act, the Food Security Act 1985 as amended, the Watershed Protection and Flood Prevention Act and others, the NRCS conducts land use inventories, soil assessments, wetland protection and restoration work, river basin surveys/investigations, watershed resource planning and watershed/flood prevention operations. NRCS also administers various programs including the Environmental Quality Incentive Program, Wildlife Habitat Incentives Program, Farmland Protection Program, Wetland Reserve Program, Small Watershed Program, Snow Survey Program and the Plant Materials Program. In addition, NRCS provides technical assistance to other programs, such as the Conservation Reserve Program and the 319 portion of the Clean Water Act, which are administered by other federal or state agencies. Through the National Resources Inventory (NRI) NRCS carries out a comprehensive program for gathering data and presenting information on the condition and trends on nonfederal lands in the United States.

NRCS develops and carries out national soil and water conservation programs in cooperation with local conservation districts, private land owners, land users, developers, community planning agencies and other federal, state and local agencies. The NRCS is the lead agency responsible for conducting National Cooperative Soil Surveys, which provide information on soils, resource data and alternatives for land use treatments. NRCS assistance is provided to landowners and other entities in making land-use decisions and changes as needed.

NRCS's PSMP Role and Responsibilities

1. Promote nonpoint source reduction activities, especially those associated with agricultural operations.
2. Assist in the dissemination of information to and advise growers, producers and farmers about PSMPs.
3. Assist growers, producers and farmers with PSMP compliance.
4. Complete soil surveys, digitize soil surveys, provide interpretation of soils information and provide technical assistance with soil related issues.
5. Provide information on irrigation water management considering soils, crop needs and consumption rates.
6. Where soil information is lacking, assess soils for pertinent characteristics (i.e., texture, depth of soils, organic matter content, natural constituents, porosity, permeability, infiltration and slope) as needed.
7. Work with producers to develop alternatives to solve resource problems and to assist producers in putting the decisions together into a comprehensive plan to address resource concerns.
8. Assist in the design, application and implementation of BMPs.

United States Department of Agriculture-Agriculture Research Service (USDA-ARS)

The USDA-ARS administers Acts of Congress which authorize federal appropriations for agricultural research. Their mission is to promote science and technology in support of agriculture,

forestry, people and communities by the allocation of federal resources for research, encouragement of scientific development, and increasing awareness of national concerns in the natural resources.

USDA-ARS is responsible for fundamental and applied research in the protection, production, and improvement of soil, water, and air. ARS studies ways of preventing agricultural chemical impairment of ground water. These studies include research and field studies on agrichemical properties, application techniques, and chemical fate and transport mechanisms. Data are used to develop a variety of ground water models. Their Pesticide Properties Database (PPD) provides users with a compendium of chemical and physical properties of widely used pesticides. The database focuses on chemical properties impacting ground water and overall water quality.

USDA-ARS's PSMP Role and Responsibilities

1. Maintain pesticide characterization database.
2. Continue conducting research to determine characteristics of additional pesticides not yet in the database.
3. Provide technical assistance in characterizing identified PSMP pesticides.
4. Provide general training and outreach.
5. Assist in the dissemination of information.
6. Assist in the development of Best Management Practices (BMPs).
7. Assist in implementation of BMP water conservation measures.

United States Department of Agriculture - Farm Services Agency

The Consolidated Farm Service Agency administers cost share programs for farmers that improve water quality, soil stabilization, and irrigation systems (Higgins, 1996).

USDA-FSA's Roles and Responsibilities

1. Provide crop production, irrigation and pesticide usage data.
2. Maintain and provide current land use aerial photographs of agricultural production areas.
3. Assist in dissemination of information to and advise growers, producers and farmers about PSMPs through one-on-one contact and newsletters..
4. Providing producers with cost-share information when pertinent to PSMPs.

United States Geological Survey (USGS)

The mission of the USGS, Water Resources Division, is to provide the hydrogeologic information needed for the optimum use and management of the Nation's water resources. The scope of responsibility includes hydrologic data collection, appraisals of problem-oriented resources, interpretive studies, and research in the field of hydrogeology. The majority of the work conducted by the USGS is at the request of local, state and federal agencies.

In Montana, the USGS has collected and disseminated information on the quantity and quality of water in streams, lakes, and aquifers for more than a century. Ground water data collected

from a variety of USGS projects are entered into the USGS data storage system called the National Water Information System (NWIS). All data from NWIS are also entered in STORET. Information obtained from the data-collection programs, investigative studies, and research efforts is also available to water-resource managers, regulators, developers, and the general public through annual data reports, formal published reports, and open-file releases.

USGS's PSMP Role and Responsibilities

1. Provide hydrogeologic data and resource information.
2. Coordinate cooperative studies in targeted areas with other agencies to maximize information and data collection efforts.
3. Provide technical assistance in water quality and quantity, hydrogeology and environmental assessments.
4. Assist in incorporating and integrating PSMPs into USGS programs.
5. Serve as a member of the PSMP Voluntary Advisory Committee.
6. Conduct tests to determine aquifer properties.
7. Estimate the potential for ground-water and surface-water contamination.
8. Assist with sensitivity and vulnerability studies including the identification of and mapping of ground-water recharge areas.

State Agencies

Montana Department of Agriculture (MDA)

The MDA encourages and promotes the interests of all agricultural and allied industrial activities in Montana. The MDA administers the Montana Pesticide Act (MPA) and the Montana Agricultural Chemical Ground Water Protection Act (MACGWPA). The MDA is responsible for conducting activities which include conducting research, establishing monitoring programs, defining Best Management Practices (BMPs), developing the Montana and EPA GMP's and SMP's, regulating chemical usage, developing remediation plans, conducting enforcement activities, teaching and training of initial and recertification courses for pesticide applicators and for the registration of pesticides in the state. Through grants and contracts, MDA also promotes research and pesticide related work. The MDA allocates funds to both DEQ and MSU ES for such work.

Education on pesticides and pesticide related topics is given by MDA. MDA has established education and training requirements for all licensed pesticide commercial and government applicators. Similar education and training requirements are established by the MSU ES for private applicators who purchase and use restricted use pesticides. Educational opportunities are also available to the general public and interested groups.

The MDA is involved in the protection and prevention of impairment of ground water and remedial efforts where ground water is affected by or is vulnerable to impairment by agricultural products and/or processes. Authority for this work is granted under the MACGWPA.

In 1984, the MDA initiated a statewide ground water monitoring program. In 1990, the MDA established a statewide network of monitoring wells in major agricultural production areas to sample ground water for the presence of agricultural chemicals. Results are stored in a database information system which can be utilized by the MDA and other agencies. Data is also forwarded to the Montana Bureau of Mines and Geology (MBMG) to be entered into the Montana Ground Water Information Center (GWIC). The MDA is also involved in cooperative ground water studies with other agencies.

Enforcement of the MACGWPA and MPA is accomplished through inspections, environmental sampling, and enforcement of specific management plans. Routine inspections are conducted on persons who use agricultural chemicals to check for compliance with pesticide label directions. MDA staff can inspect records, collect ground water samples, and monitor compliance with MDA issued compliance orders and SMPs. Compliance orders can be issued whenever a standard for agricultural chemicals in ground water has been violated or whenever an incident has occurred that creates a significant probability that agricultural chemicals will enter ground water. Compliance orders may require cleanup of residues and monitoring of soils and ground water.

MDA staff also provide technical assistance in cases of incidents involving agricultural chemicals. Examples of incidents include spills, misuse of products, illness, and environmental damage. Technical assistance can be used to control incidents, assess damage, and remediate problems. Such incidents will generally be investigated to determine causative factors and possible violations of law.

The analytical laboratory at Montana State University is jointly operated by the Agricultural Sciences Division of the Montana Department of Agriculture and the Agricultural Experiment Station of Montana State University. This joint operation is beneficial to both agencies for economic and efficiency reasons. The laboratory's objective is to provide reliable and timely analytical services at a reasonable cost. The laboratory utilizes validated official methods when available and maintains a rigorous Quality Assurance and Quality Control program.

MDA's PSMP Role and Responsibilities

1. Develop and coordinate activities of the initial assessment team.
2. Establish PSMP advisory committee.
3. Assess available data and information and identify data gaps.
4. Coordinate development of management plans.
5. Dedicate staff time to the development of ground water state management plans.
6. Work with growers, producers, pesticide applicators, the public as well as other agencies to implement management plans.
7. Sample and monitor ground water for pesticides.
8. Conduct education and training of commercial and government pesticide applicators.
9. Conduct investigatory and enforcement actions as needed.
10. Coordinate periodic evaluations of management plans.
11. Develop GIS maps.

12. Disseminate PSMP plans, data, information and requirements.
13. Manage PSMPs.

Montana Department of Environmental Quality (DEQ)

The Montana Water Quality Act (MWQA) (75.5.101-1122, MCA) provides authority to DEQ for water quality management. The MWQA authorizes DEQ, under the oversight of the Board of Environmental Review to establish water quality standards, perform water quality monitoring, promote voluntary measures to protect or improve water quality, issue permits to surface and ground water dischargers, conduct inspections, issue compliance orders, and levy civil and criminal penalties for violations. It is a violation of the MWQA to cause pollution of state waters or to place wastes in a location where they will cause pollution of state waters. The MWQA has a nondegradation policy requiring that existing water quality be maintained if it is better than established standards.

The MWQA authorizes DEQ to cooperate with public and private entities to plan for the prevention and control of pollution. Permits are required and issued by DEQ for the discharge of pollutants to ground and surface waters. The MWQA also provides broad authority for control of nonpoint source pollution through application of "all reasonable land, soil, and water conservation practices" (ARM, 17.30.1011). These practices must protect present and reasonably anticipated beneficial uses (ARM, 17.30.1003).

The DEQ has provided funding for agricultural chemical research projects and cooperated with other state and federal agencies conducting agricultural chemical impairment research. DEQ has sponsored ground water monitoring projects and cooperates with other state and federal agencies such as the Montana Bureau of Mines and Geology (MBMG), MDA, and the USGS to acquire ground-water data. Interagency cooperation has provided for and improved many projects including the production of a statewide map of the distribution, use, and vulnerability of ground water and the *Nonpoint and Point Source Demonstration Project of Wellhead Protection for Alluvial Aquifers Within the Clark Fork of the Yellowstone Valley.*

DEQ administers the Total Maximum Daily Load (TMDL) program. The TMDL program develops and implements pollution control plans for those surface waters that are not meeting water quality standards or achieving their beneficial uses. The TMDL process can involve ground water, when contaminated ground water is discharging to surface water and causing or contributing to a violation of water quality standards.

The DEQ is involved in educational programs regarding nonpoint source pollution abatement through the activities of the Planning, Prevention, and Assistance Division. Activities include source water assessment and a comprehensive ground water and wellhead protection program. The Department of Environmental Quality provides loans for improvements to drinking water supplies. DEQ protects ground water by issuing ground water permits. In response to public concerns about Montana's ground water, the DEQ is accelerating education programs through the Nonpoint Source

(NPS) Program. The NPS Program uses grants received from EPA to promote agricultural and forestry BMPs.

DEQ assists anyone who owns a well that provides drinking water to the public in preventing pollution of that drinking water through the voluntary Wellhead Protection Program. This Program was started in 1994 to provide training for professionals working with drinking water supply and works with individual communities and private well owners on plans to protect the wells and sources of water that supply the wells. These wells can vary from a hand pumped well in a campground to a large community well system serving over 50,000 people. An important component of the program is coordinating activities with other groups doing similar work.

In 1998, the DEQ added the Source Water Assessment Program to its wellhead protection efforts. This new program was authorized under the Safe Drinking Water Act Amendments of 1996. It requires DEQ to delineate or determine the sources of water that contribute to a public water supply from either ground or surface water. It also requires that an assessment be made of potential threats to that groundwater. Once the delineation and assessment are completed, the owner or operator of the water supply may develop a protection plan using a model available from DEQ.

DEQ is also responsible for developing and submitting a Comprehensive Groundwater Protection Program Plan to EPA. This document contains recommendations on ways to cooperatively work to protect groundwater in Montana. Recommendations are jointly developed with DNRC through its water planning process including hearings and legislative review.

The potential problem of agrichemicals contaminating surface water and ground water is addressed via regular training of water and wastewater operators. Staff are available to train the public in wellhead protection, the mechanisms of ground water impairment and the testing and treatment of contaminated sources. Training also includes general sessions on handling practices for herbicides around water and waste water system components (such as lagoons, hydrants, valves, etc.). DEQ also administers the Public Water Supply Law, Title 75, Chapter 6, MCA. DEQ enforces maximum contaminant levels (MCLs) in public water supplies pursuant to ARM 17.30.203-207. Included in the MCLs are acceptable levels for pesticides and nitrate in drinking water. DEQ also administers numerous other statutes related to water quality protection and pesticides including: CERCLA (Superfund), Title 75, Chapter 10, U.S.C., the Sanitation in Subdivisions Act, Title 76, Chapter 4, MCA and the Hazardous Waste Management Act, Title 75, Chapter 10, MCA.

DEQ's PSMP Role and Responsibilities

1. Develop ground water and surface water quality standards.
2. Determine if ground water of concern is designated as Class I, II, III, IV, or "Sole Source."
3. Classify ground water of concern under a PSMP.
4. Provide technical assistance in identifying ground water resources of concern.
5. Provide oversight of Public Water Supply (drinking water) pesticide analyses.
6. Assume the lead role in PWS and wood treatment facility contamination and remediation.
7. Serve as a member of the Voluntary Advisory Committee.

8. Provide ground water related training to state employees and public water supply operators with ground water responsibilities.
9. Administer the Nonpoint Source (NPS) program.
10. Promote BMPs.
11. Administer the source water assessment and a comprehensive ground water and wellhead protection program.

Montana Department of Natural Resources and Conservation (DNRC)

The DNRC is responsible for ensuring the wise management, development, conservation, and use of Montana's natural resources in a manner consistent with environmental quality. It works to sustain and improve the benefits derived from our water, soil, and range and to make certain that water projects under its jurisdiction are developed with minimum adverse environmental effects. The DNRC directs a wide variety of programs in meeting these and related goals and objectives. DNRC was created pursuant to 2-15-3301, MCA.

The Water Resources Division administers the Water Use Act which provides a system for issuing new surface and ground water use permits and the development and updating of a centralized water rights data base of all surface and ground water uses. DNRC issues, conditions or denies new surface and ground water permits based on criteria which includes the availability of unappropriated water; the effects on the quality and quantity of water for existing uses; whether the proposed use is a beneficial use; and that the proposed means of diversion, construction, and operation are adequate. DNRC may condition water use permits to protect existing water users and other planned or proposed beneficial uses. Through the State Water Planning process, DNRC facilitated and staffed a collaborative process involving water users, ground water professionals, academicians, and others in drafting a Comprehensive Ground Water Plan. This draft plan has been submitted to EPA by the Montana Department of Environmental Quality in the spring of 1997 to satisfy it's requirement for a Montana's Comprehensive Groundwater Plan. DNRC is in the process of finalizing the Ground Water Plan section. Also, DNRC assists water users with the management of ground water by providing financial and technical assistance.

The Reserved Water Rights Compact Commission provides technical support essential to negotiations by the Reserved Water Rights Compact Commission, such as historical and legal research, analysis of soils, vegetation, land use, hydrogeology, and analysis of economic and engineering feasibility. The commission negotiates water rights settlements of federal agencies and tribes claiming federal reserved water rights. The settlements usually contain a component on ground water quantity and impacts.

Controlled ground water areas may be designated by DNRC. Such areas can be proposed by the DNRC, or by petition of state or local public health agency or by petition signed by at least 20 or one-fourth of the users of ground water in a ground water area. Basically, the criteria for establishing a controlled ground water area focus on excessive ground water withdrawals. DNRC

is also required by Montana law to ensure that ground water is not wasted and not contaminated by water users.

The Conservation and Resource Development Division provides technical, administrative and financial assistance to local governments, state agencies and private citizens for the conservation, development, protection and management of the state's natural resources. By making financial assistance available from the division's programs the DNRC provides for research, education, data collection, and active protection of ground water resources. Such grants make it possible for agencies, groups and individuals to protect ground water resources and human health by identifying and quantifying problems, by providing financial assistance to develop management approaches to prevent, mitigate or minimize problems and to finance solutions for the management and protection of ground water resources.

DNRC's PSMP Role and Responsibilities

1. Provide technical assistance with land management, conservation, environmental development, water protection measures and delineation of controlled ground water areas.
2. Provide financial assistance through grants that would provide necessary or desirable information on ground water and pesticides by any agency or group addressing aspects of PSMPs.
3. Identification and mapping of wetland and unique areas within PSMP management areas.
4. Serve as a core assessment group member and member of the Voluntary Advisory Group.

Montana Bureau of Mines and Geology (MBMG)

The MBMG is a nonregulatory research and public service agency located at Montana Tech of the University of Montana, Butte, Montana. The MBMG administers the Ground Water Assessment Program and provides oversight and technical assistance to DEQ and EPA on several Superfund sites.

The MBMG gathers and publishes information on the geology, topography, and mineral deposits of the state, including metals, non-metals, coal, oil, gas, and ground water. These responsibilities include the study of geologic and hydrogeologic processes in Montana. Data and information are collected through cooperative participation with other agencies. Laboratory studies conducted by the Bureau generate ground-water quality data which may be used by other agencies. The MBMG functions as a ground-water information depository (Ground Water Information Center, GWIC) which includes information on well logs, water quality data and drilling.

The GWIC is housed at the MBMG and is the repository for most of Montana's existing ground-water data. The MBMG staff have been responsible for many ground-water field investigations and have performed work under contract or in cooperation with virtually all other state and federal agencies that are responsible for ground-water programs in Montana. The research, data collection, and analyses provided through the program supply an information data base that assists

regulatory agencies, public and private organizations and individuals in making ground-water management decisions and recommendations.

The Montana Ground Water Assessment Act established a comprehensive program at the MBMG to assess and monitor the state's ground-water. The primary goal of the Ground Water Assessment Act is to improve the quality of ground-water management, protection, and development decisions within the public and private sectors by systematically characterizing and monitoring the state's ground water and by improving access to ground-water information.

The Ground Water Assessment Steering Committee was established by the Legislature to guide the assessment and monitoring programs and to coordinate ground water management, protection, development, and research functions among units of federal, state and local government. The Steering Committee includes water agencies in state and federal government, and representatives of local government and water-user groups.

The Ground Water Monitoring Program was designed to provide a long-term record of water quality levels for the state's major aquifers. The Ground Water Characterization Program will map the distribution and document the water quality and physical properties of individual aquifers in 21 areas, each being one to five counties in size.

All information generated by the Assessment Act programs will be maintained at the GWIC and distributed through the GWIC and the Natural Resources Information System (NRIS).

MBMG's PSMP Role and Responsibilities

1. Provide technical assistance in conducting hydrogeological assessments and review available data and related information for PSMP designated areas.
2. Complete vulnerability and water quality information and data under the Assessment Program for PSMPs.
3. Provide technical assistance in well site selection, monitoring well installation, existing well assessments and hydrogeological evaluations of PSMP designated areas.
4. Serve as member of the Voluntary PSMP Advisory Committee.

Montana State University (MSU)

MSU functions as a land grant research and educational institution providing students opportunities to learn and become proficient users and managers of environmental resources. The University offers programs through the Engineering and Earth Science programs and the Land Resources and Environmental Sciences Department. Ground water issues and science-based agricultural activities are addressed through course work offered as a part of student curriculums and basic and applied research programs. Through research, MSU provides knowledge, tools and efficient methods of resource use which cause minimal disruption of and maximum protection of the environment.

The Montana Agricultural Experiment Station was established as a result of the federal Hatch Act of 1887. Montana State University Agricultural Experiment Station (MSU AES) directs eight field Agricultural Experiment Stations involved in basic and applied research on agricultural production, environmental protection and sustainability. The Agricultural Experiment Stations, located throughout the state, are representative of the various geographic, geologic, topographic, and climatic conditions found in the state of Montana. Through research at the University and the Agricultural Experiment Stations, valuable data and information are provided to agricultural users that is site-specific. The analytical laboratory of the Agricultural Experiment Station offers analytical services including pesticide residue analysis in water and other environmental samples.

MSU's PSMP Role and Responsibilities

1. Conduct basic and applied research pertinent to pesticides and establish management practices for conditions found in Montana.
2. Disseminate PSMP related information and data.
3. Provide technical data for the following areas as they relate to PSMP development, implementation and evaluation:
    - crops, cropping rotations and patterns,
    - diseases, insects and weeds of crops,
    - Integrated Pest Management (IPM), farm management and irrigation management,
    - BMPs (specific to products and PSMP areas) and
    - GIS data/or mapping.

Montana State University Extension Service (MSU ES)

The Montana State University Extension Service was established as a result of the federal Smith-Lever Act of 1914. The MSU ES is headquartered at MSU in Bozeman and serves 53 of 56 Montana counties through 49 county Extension offices. The mission of the MSU ES is to help people improve their lives and communities through an educational process that uses research-based knowledge in response to local, state, and national issues. Technically trained specialists conduct applied research and demonstration projects, develop and deliver educational programs, and provide technical assistance on a variety of water quality issues. The private pesticide training program has conducted numerous training programs involving ground water protection activities and providing basic information on the safe handling, application, storage, and disposal of pesticides and pesticide containers. The Integrated Crop and Pest Management (ICPM) educational program attempts to reduce pesticide applications in grain and hay production systems. A comprehensive educational program on the optimum use of nutrients and soil management practices for environmental protection, on the many soil and climatic conditions in Montana is directed through the soils program. The Montana Farmstead Assessment System (Farm*A*Syst) risk assessment program have been developed as well. County-based faculty conduct classroom and field educational programs. The MSU ES participates in the development and delivery of educational programs for the Certified Crop Adviser (CCA) program.

MSU ES's PSMP Role and Responsibilities

1. Provide agricultural technical assistance to farmers and producers.
2. Assist with interaction between growers, producers, farmers, others and the voluntary advisory committee.
3. Conduct Private Applicator Training (PAT) training which includes ground water, surface water and PSMP related topics.
4. Disseminate PSMP information through County Extension offices.
5. Develop PSMP information through Montguides, bulletins, videos and/or fact sheets.
6. Provide technical assistance for the following areas as they relate to PSMP development, implementation and evaluation:
    - crops, cropping rotations and patterns,
    - diseases, insects and weeds of crops,
    - pesticide usage,
    - Integrated Pest Management (IPM), farm management and irrigation management,
    - BMPs (specific to products and PSMP areas) and
    - GIS data/or mapping.
7. Increase awareness and appropriate, proper and efficient use of pesticides.
8. Serve as member of the PSMP Voluntary Advisory Committee.
9. Disseminate general information and conduct education activities as they relate to PSMPs.

Montana State Library (MSL)-Water Information System (WIS)

The WIS is a water data clearinghouse and referral service within the Natural Resource Information Service (NRIS) at the State Library. The Water program serves state and federal governmental agencies, business and industry, and private citizens. The System provides access to all kinds of water-related information from a variety of sources including; the USGS, EPA, NRCS, USWS, MBMG, and others. In addition, the WIS promotes and facilitates information sharing to help prevent duplication of effort among agencies and organizations that collect, manage, or use water information. The primary objective is to assure that information collected at considerable expense is available for use to the fullest possible extent.

MSL-WIS's PSMP Role and Responsibilities

1. Act as information and data repository for all federal and state programs that develop, assess, collect or otherwise handle information on pesticides and ground water.
2. Conduct literature searches.
3. Disseminate information.
4. Promote and facilitate information sharing between Montana agencies.

Local Government Agencies

Conservation Districts (CDS)

Montana has 59 conservation districts which provide for the conservation of soil, water, and other natural resources. The districts operate within county-sized areas under the guidance and direction of a locally elected board of supervisors. Each district board establishes its priorities on local resource conditions and community needs.

Districts often act as liaison between land users and state/federal agencies to direct available resources toward local needs. Typical conservation district activities include natural resource education and information, resource assessments and conservation projects. Protection of streambeds and streambanks is administered by the conservation districts through the National Streambed and Land Preservation Act. Water pollution control, an extension of the conservation district's work on soil erosion, helps land users learn how to keep sediment, nutrients, and chemicals out of the water. Many district research management programs include ground water assessments, water reservations, irrigation scheduling, and wetland preservation and restoration.

Much of the conservation district's accomplishments are achieved through seminars, workshops, tours, and educational programs. Conservation districts both sponsor and receive grants for demonstration projects on nonpoint source pollution prevention using state-of-the-art techniques (Schmitz, 1992).

CD's PSMP Role and Responsibilities

1. Identify potential cooperators.
2. Assist with interaction between producers, growers and farmers and the voluntary advisory committee.
3. Provide technical assistance (within districts) in determining area characteristics which may include cropping, irrigation and management information.
4. Provide plan compliance information and assistance.
5. Disseminate PSMP information.
6. May incorporate PSMP elements into Demonstration NPS projects.
7. Provide general education and training to cooperators about PSMPs.
8. Integration of conservation practices and conservation.
9. Conduct research on ground water management that includes: ground water assessment, water reservations, irrigation scheduling and wetland preservation and restoration.

Others

Montana Salinity Control Association (MSCA)

The Montana Salinity Control Association (MSCA) is a conservation district based program dedicated to the prevention, reclamation and education of nonpoint source pollution problems affecting Montana. The organization represents conservation districts in 33 eastern counties where

salinity is a recognized nonpoint source pollution problem. Conserving and improving soil and water quality are the organization's principal goals. The MSCA works cooperatively with local, state, federal and private entities to achieve these goals.

The MSCA conducts hydrogeologic site characterizations, identifies ground water recharge areas, samples and monitors soil and water resources, conducts nonpoint source pollution prevention and reclamation demonstration projects, and makes resource management recommendations on a site specific basis. Emphasis is placed on intensive and alternative cropping systems, improving water management to prevent and reclaim nonpoint source pollution problems, and promote soil and water quality conservation. The MSCA provides educational materials for symposiums, workshops, farm tours and school courses.

MSCA's PSMP Role and Responsibilities

1. Assist in education and information dissemination.
2. Conduct water quality work.

Agriculture Grower and Related Groups

1. Provide data and information related to specific crops.
2. Serve as a Voluntary Advisory Committee Member.
3. Assist in plan development and implementation.
4. Disseminate plan information and requirements.

Local Units of Government

1. No specific role but where management plans may affect local water supplies, public participation in the process will be expected. Local units of government may be required to identify and/or require local actions for effective implementation of PSMPs. Specific roles and responsibilities will be spelled out under PSMPs.

Pesticide Registrants

Registrants research, develop, produce, market and sell pesticide products. Prior to any pesticide being used, registrants must register their products with EPA. Registrants must, when they register a product, submit supporting information about the pesticide which allows EPA to determine the potential risk the product poses to human health and to the environment. Registrants must also register pesticide products in Montana prior to any sales or use. Pesticide registrants will not make governing decisions nor control the PSMP process but will be expected to support state management plans and foster product stewardship.

1. Registration of products in Montana.
2. Submittal of environmental fate data for products (research and studies) when required by the state as a part of a pesticide's registration.

3. If the environment of the research/study from which data submitted to the state is not representative of the conditions found in Montana, registrants may be required to provide data or information necessary to the state to determine the potential for ground water impact under Montana conditions.
4. If #3 cannot be accomplished, registrants may be expected to conduct, under state oversight, an environmental impact study in Montana OR may be expected to provide the state with the financial resources to conduct an environmental impact study in Montana.
5. Amend labels when agreement between the state and registrant is reached or when state requires such revisions as a condition of continued registration.
6. Provide technical assistance to the state in development of appropriate laboratory analytical ground water and soil methodology as needed and requested.
7. Assist in addressing resolution and/or management of impairment conditions in Montana, which may include:
   A. Financial assistance in addressing problems (sampling, monitoring, analytical analysis, technical assistance, etc.),
   B. Toxicology information,
   C. Sampling and/or monitoring.

Plan Concurrence

The attached letters of concurrence indicate that the core PSMP group have reviewed the agency description contained within this plan and find the agency description to be accurate and find the PSMP development and implementation role(s) and responsibility(ies) following the agency description to be acceptable.

Cited References

Higgins, Susan. 1996. Headwaters to a Continent. Montana Watercourse, MSU; Bozeman, MT.

Schmitz, Steve. 1992. Montana Department of Natural Resources and Conservation, Conservation Districts Bureau Program Description. Information provided by Steve Schmitz. Unpublished, DNRC, CD, Helena, MT

Legal Authority

General Legal Authority To Regulate Pesticides and Protect Ground Water

Federal

The Federal Insecticide, Fungicide and Rodenticide Act (7 U.S.C. § 136 et seq.)

Pesticide registration, manufacture, sale, use and disposal fall under the authority of the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). FIFRA also sets forth the qualifications for persons applying pesticides. In 1972, amendments to FIFRA established certification programs for pesticide applicators. FIFRA's intent was clarified through additional amendments in 1975, 1978, 1980, 1981 and 1988. In 1996 the Food Quality Protection Act (FQPA) was established which contained important amendments to the FIFRA and Federal Food, Drug and Cosmetic Act (FFDCA). Mandatory cancellation of a pesticide's registration after five years was eliminated and periodic review of pesticide registrations was established. Additionally, the reregistration procedures for pesticides registered before November 1984 were revised requiring EPA to reassess tolerances and exemptions issued under the Federal Food, Drug, and Cosmetic Act and include exposure to drinking water sources .

Section 26, United States Code (USC) of FIFRA states that States and Tribes shall have primary enforcement responsibility for FIFRA if they have the enforcement capabilities and a plan for enforcement approved by the administrator of EPA. In 1979 Montana entered into an agreement and was granted primacy by the EPA for enforcement of pesticide laws . This designation makes the Montana Department of Agriculture responsible for conducting pesticide enforcement in Montana.

The Clean Water Act (33 U.S.C. § 466 et seq.)

The purpose of the Clean Water Act (CWA) is to "restore and maintain the chemical, physical and biological integrity of the nation's water" and to provide protection of the nation's surface and ground water resources. The CWA developed water quality goals for the nations water resources to be achieved by 1983. Spills, releases and discharge (point sources) of pollutants into water resources is also regulated under the CWA, section 402, the National Pollution Discharge Elimination System (NPDES). Nonpoint sources of pollution are addressed in section 319 of CWA which directs states to develop pollution reduction grant programs. The Nonpoint Source Pollution, Wellhead Protection and Statewide Comprehensive Ground Water Protection Strategies are programs that have been developed and implemented through CWA grants.

The Safe Drinking Water Act (42 U.S.C. §300 eq seq.)

The safety of current and future public drinking water supplies is achieved through the Safe Drinking Water Act (SDWA). Under the SDWA, EPA was directed to establish national drinking water quality standards (MCLs and HALs). The Safe Drinking Water Act amendments of 1986 established a list of chemicals for which standards needed to be developed. Wellhead Protection Programs and the designation of sole source aquifers were also authorized under the 1986 amendment for drinking water supplies.

The Resource Conservation and Recovery Act (42 U.S.C. § 6901 et seq.)

The management of solid wastes in such a way as to provide better protection of public health and the environment is the goal of the Resource Conservation and Recovery Act (RCRA). RCRA regulates the generation, storage, transport, treatment and proper disposal of hazardous substances and wastes. RCRA designates types of hazardous wastes and defines in what quantities, concentrations and forms of disposal that hazardous wastes represent a threat to human health or the environment. Pesticides which meet the defining criteria of a hazardous waste are subject to all pertinent regulations.

The Comprehensive Environmental Response, Compensation and Liability Act (42 U.S.C. § 9601 et seq.)

Responses to abandoned hazardous waste sites are conducted under guidance of the Comprehensive Environmental Response, Compensation and Liability Act (CERCLA). CERCLA provided for a means to identify responsible (liable) parties, established a trust fund to pay for response activities and authority to collect compensation from liable parties for clean up. CERCLA is often referred to as the Superfund law. Additional money for the program was authorized under the 1986 amendment SARA (Superfund Amendments and Reauthorization Act of 1986, P.L. 99-499).

Toxic Substances Control Act of 1976 (P.L. 94-469)

Manufacturing, use and disposal of chemical substances is regulated under Toxic Substances Control Act (TSCA). The Act gives EPA the right to require toxicity information from manufacturers.

State

Montana Agricultural Chemical Ground Water Protection Act (80-15-101 et seq., MCA)

Enactment of the Montana Agricultural Chemical Ground Water Protection Act (MACGWPA) occurred in 1991. The Act directs the Montana Departments of Agriculture and Environmental Quality:

1. Protect ground water and the environment from impairment or degradation resulting from the use of agricultural chemicals;
2. Allow for the proper and correct use of agricultural chemicals;

3. Provide for the management of agricultural chemicals to prevent, minimize and mitigate their presence in ground water and
4. Provide for education and training of agricultural chemical applicators and the general public on ground water protection, agricultural chemical use, and the use of alternative practices.

The Departments of Agriculture and Environmental Quality were given the administrative responsibility for the act. The Department of Environmental Quality is responsible for:

- establishment and enforcement of agricultural chemical ground water standards and interim numerical standards (80-15-201, MCA),
- providing comments to the MDA during the development of agricultural chemical ground water management plans (80-15-203, MCA),
- promoting research (80-15-107, MCA), and
- related responsibilities as set forth in Title 75, chapter 5.

The Department of Agriculture is responsible for:

- preparation, implementation, and enforcement of agricultural chemical ground water management plans (80-15-211 through 218, 80-15-401 through 405 and 80-15-411 through 414, MCA),
- public education (80-15-106, MCA),
- other duties related to promoting research (80-15-107, MCA) and
- related responsibilities set forth in Title 80, chapter 8 and 10.

Joint responsibility is shared by the MDA and DEQ in monitoring, cleanup, quality control procedures, emergency procedures and administrative penalties. The Departments are required to coordinate their rulemaking efforts and whenever possible adopt identical rules for the areas of shared responsibility, including:

(1) ground water monitoring,
(2) field and laboratory operational quality assurance, quality control, and confirmatory procedures,
(3) maintenance of confidentiality of certain data,
(4) administrative civil penalties.

Montana Pesticide Act (80-8-301-306, MCA)

The Montana Pesticides Act (MPA) became law in 1971 and was amended in 1991 and 1993. MPA grants authority to the MDA to register pesticides, license government and commercial applicators and dealers, permit farm applicators and enforce pesticide regulation.

Enforcement of the MPA is the responsibility of the MDA (80-8-304, MCA). Authorized representatives of the MDA can enter public or private property after obtaining consent or a warrant to conduct inspections. MDA representatives are also authorized to collect samples of pesticide

products and any portion of the environment that may have been exposed to pesticides (80-8-302, MCA). Environmental samples provide information on the presence of pesticide residues. This information is helpful in documenting the presence of illegal pesticide residues, determining the presence of harmful residues, and as evidence in pesticide investigations.

The MDA also has authority to investigate agricultural chemical spills. The MPA allows the MDA to issue compliance orders. These can be issued to any person who has committed a violation of the Act. Orders can also be issued requiring the clean up of any pesticide that has been accidentally or purposely spilled, dumped, misused, or unlawfully used. The requirements that can be set forth in a compliance order are similar to those allowed by the MACGWPA including removal of contaminated soil and monitoring of pesticides in water, soil and other materials.

Persons who violate the MPA can be subject to misdemeanor fines or civil penalties. In assessing civil penalties, the MDA will consider the effect on a person's ability to stay in business, the degree of care exercised by the offender, whether significant harm resulted, and the gravity of the violation.

The MPA (80-8-101-405, MCA) gives MDA the authority to restrict or cancel a pesticide if the pesticide is determined to cause a public health or environmental problem. Pesticides must be registered (80-8-201, MCA) and it is unlawful to sell or distribute pesticides without registration. Under this same section, MDA can determine that a pesticide can be registered with restrictions or must be tested under Montana field conditions, and can require the manufacturer to submit evidence of a pesticide's safety. Registrations can be revoked or refused for misbranding, adulteration or other "good cause."

MDA also has authority under the MPA and FIFRA to enforce directions for use on pesticide labels. Under 80-8-201, MCA, MDA has authority to enforce rules establishing restrictions on pesticide use. Penalties for violations of pesticide label directions or state adopted rules are specified in ARM 4.11.914. These penalties range from warning letters to administrative fines of up to $1000 per incident.

Montana Water Quality Act (75-5-101-1122, MCA)

The DEQ has statutory authority under the Montana Water Quality Act (75-5-101-1122, MCA) for water quality management. The DEQ also has the authority to regulate agricultural chemicals once they are designated as wastes. Under the Montana Water Quality Act (MWQA), enacted 1967, DEQ was given authority to establish programs, rules and policies to protect water resources. This authority forms the basis for ground water and surface water resource protection under a SMP (a management plan developed by the State). In addition, DEQ receives delegation from the EPA laws for certain programs. DEQ is given the authority to:

1. Establish a water quality protection program and philosophy,
2. Establish water quality standards to protect drinking water supplies and water resources,
3. Regulate discharge of pollutants (including pesticides) to the environment,

4. Regulate drinking water systems,
5. Respond to pollution of water resources, through enforcement and cleanup,
6. Provide for restoration and replacement of contaminated drinking water supplies, and
7. Regulate solid waste and hazardous waste disposal.

Although application of pesticides is, in general, not subject to DEQ permitting requirements, rules promulgated under 75-5-201, MCA, provide for regulation of activities which are shown to cause surface or ground water contamination, including requirements for monitoring. The DEQ has been given statutory authority under the Montana Water Quality Act (75-5-101-1122, MCA) for water quality management. The DEQ should also be notified of agricultural chemical spills. The DEQ has the authority to regulate agricultural chemicals once they are designated as wastes.

Under Montana's Public Water Supply Law, 75-6-101-121, MCA and delegation from the EPA, DEQ regulates certain drinking water systems, including specifying water quality monitoring requirements. These requirements are based on drinking water system service connections and customers served. The law requires that drinking water systems respond to detections of pesticides through increased sampling activity or corrective action to remove contaminants from the drinking water supply.

DEQ has statutory authority to seek penalties for pollution, including civil or criminal penalties, to execute consent agreements with responsible parties, and to levy fines. Title 75-5-635, MCA, enables DEQ to seek cost recovery from responsible parties for expenses incurred in responding to contamination of potable water supplies.

Montana Solid Waste Management Act (75-10-201-233, MCA)

The Montana Solid Waste Management Act (MSWMA) became law in 1977 and was amended in 1991. Rules established in accordance with this Act authorize the DEQ to provide for proper solid waste management and disposal. In the event pesticides are designated as a hazardous waste, DEQ assures proper management and oversight. The rules stipulate acceptable minimum management practices for solid waste disposal. The Department of Environmental Quality is responsible for the administration of the MSWMA.

Montana Comprehensive Environmental Cleanup and Responsibility Act (75-10-705-724, MCA)

The Montana Comprehensive Environmental Cleanup and Responsibility Act (CECRA) became law in 1989 and was amended in 1991. CECRA was enacted to protect public health and the environment from the release of hazardous substances, to encourage cleanup of releases, and to fund cleanups in cases of no voluntary actions. Cleanup of pesticide impaired sites is also covered under CECRA. CECRA is administered by the Department of Environmental Quality.

The Montana Water Use Act (85-2-101 - et seq., MCA)

Enacted in 1973, the Montana Water Use Act (MWUA) changed Montana water right laws in a number of ways. Significant changes included the creation of closed ground water areas and a permit and reservation system. Under the reservation system, water may be reserved for beneficial

uses including minimum stream flows and/or water quality purposes. The DNRC and the Montana Water Court manage the provisions of the Act.

The Montana Ground Water Assessment Act (85-2-901-907, MCA)

Enacted in 1991, the Act provided a means to characterize the state's ground water volume, quality and flow patterns. The Act established a ground water characterization and monitoring program funded by state special revenue funds. The Montana Bureau of Mines and Geology is responsible for carrying out the provisions of this Act.

The Montana Hazardous Waste and Underground Storage Tank Act (75-10-401-451, MCA)

The Montana Hazardous Waste and Underground Storage Tank Act became law in 1981 and was amended in 1991. It established a program for proper handling and disposal of hazardous wastes. Under certain circumstances, agricultural pesticide residues, rinse waters, empty containers, canceled or contaminated formulations and spill cleanup residues could be defined as hazardous wastes. The DEQ has adopted Administrative Rules of Montana, Title 16, Chapter 44 to manage these wastes.

Legal Authority to Develop and Implement Management Plans

Federal

Pursuant to FIFRA sections 3 and 6, USC, EPA has the authority to place use restrictions on or propose cancellation of pesticides. Where national prohibition of pesticide use is not necessary but management of the pesticide is deemed necessary, EPA may require a PSMP to be developed by individual states wishing to continue use of that pesticide within that state.

EPA can designate or target a particular chemical (which is in the Federal Register) and specify that use of that chemical can only be continued if a PSMP is prepared and submitted to EPA. PSMPs must be adopted as MACGWPA administrative rules and are therefore enforceable.

State

Development

The MACGWPA (80-15-212, MCA) authorizes the MDA to develop and implement SMPs. The MDA will have the primary responsibility in determining whether or not to develop a management plan (PSMP) for the pesticide(s). The MDA, pursuant to 80-15-215(2), MCA, will contact users of the agricultural chemical and user groups that will be subject to the PSMP to request their recommendations concerning the development of the plan. Such contacts will be made within available resources. The current and potential beneficial use of the ground water included or affected by the PSMP must be considered (80-15-213(1), MCA). If ground water to be protected under a management plan has not been classified, the classification representing the highest quality will be used until such time as the water is classified by the DEQ. The MDA is also required to consider the benefits of appropriate use of the agricultural chemical. The MDA will consult with the Montana

State University Extension Service (80-15-215 (1), MCA) concerning the benefits to appropriate use of agricultural chemicals. When determining whether to develop a PSMP, the pesticide's current and future usage, available pesticide alternatives and the impact of discontinuing the pesticide's use will be considered.

Development of a PSMP is based on established criteria (80-15-212(1)(d), MCA). Management plans will be developed and implemented when any one of the following conditions are found to exist:

a. When the level of an agricultural chemical found in ground water is at 50% of the standard or interim numerical standard at a point of standards application and is scientifically validated;
b. When a definite trend of increased presence of the agricultural chemical in ground water at a point of standards application is scientifically validated;
c. When agricultural chemicals have been determined to have migrated in the ground water from the point of detection;
d. When EPA proposes to suspend or cancel registration of an agricultural chemical, prohibits or restricts the chemical's sale or use in the state, or otherwise initiates action against a chemical because of ground water concerns and when EPA's action, restriction, or prohibition will be implemented unless the state develops an adequate management plan; or
e. When agricultural chemicals that possess or are suspected of possessing properties that indicate potential to migrate to ground water are being applied to areas underlaid by ground water vulnerable to impairment.

The Department will prioritize the preparation of the PSMPs on the basis of the specific circumstances of each area, available resources (80-15-212 (3), MCA) and the use or lack of use of the EPA designated pesticide. All PSMPs must conform to both state and federal requirements.

If it is determined that a PSMP will be developed, the MDA will notify the EPA of its intent. The MDA will be the lead agency for development of PSMPs. The EPA GMP will be the basis from which all PSMPs will be developed. Recommendations will be sought from pesticide users, grower groups, individuals and groups that will be subject to or impacted by the PSMP before and during the development of the management plan (80-15-215 (2), MCA). Local, state, or federal entities will also be consulted during the development of PSMPs. Involvement of individuals, groups and entities will be based on the particular aspects of the PSMP and the pesticide in question.

A state management plan (SMP or PSMP) must include the following components:

- Requirements to prevent ground water impairment that are based on ground water use, value, and vulnerability and that address all applicable aspects of agricultural chemical use (80-15-214 (1)(a), MCA) and,
- Requirements to prevent or minimize further presence of the agricultural chemical in the ground water and to provide protection for the present and future beneficial use of the ground water. (80-15-214 (1)(b), MCA).

Additional information, elements, and provisions will be considered for incorporation into the PSMP when necessary to achieve the specific requirements of 80-15-214 (2), MCA and EPA requirements for PSMPs.

Under 80-15-212 (2), MCA, PSMPs may identify specific individuals or user groups within the plan. Those individuals and/or groups affected by the plan may be notified of conditions in the plan. Likewise, owners and/or users, when appropriate, may be notified when a PSMP will directly affect specified areas. Any person who sells agricultural property subject to provisions of a PSMP must, when selling that property, provide the buyer with written notice about the obligations of ownership under the PSMP and forward a copy of the notice to the MDA, 80-15-218, MCA.

Upon completion of a PSMP, the MDA will submit the plan to the DEQ for comment (80-15-217 (1), MCA). DEQ will have 30 days in which to the review the PSMP and to prepare and submit comments to the MDA on the PSMP. The MDA will review all comments from DEQ and make revisions as necessary.

The MDA will submit PSMPs to EPA for approval. PSMPs will be adopted under the authority and following the procedures of the MACGWPA as an administrative rule (80-15-217 (1), MCA). Adoption of the enforceable portions of the plan will be made through rulemaking.

Implementation

The primary means of implementing the PSMP will be the adoption of the PSMP as a state rule. MDA has the legal authority to require supplemental labeling of pesticides registered in Montana. Those pesticides subject to PSMP requirements will require supplemental labeling changes. New labeling will contain a PSMP statement indicating the restrictions and requirements of the plan or directing the user to additional information pertaining to PSMP restrictions and requirements.

The approved and adopted PSMP will be the basis for action taken by the State relative to ground water contamination by the pesticide. The MDA will be lead agency in enforcing the PSMP. Affected and involved agencies will be responsible for implementing their respective component(s) under the PSMP.

Emergency Situations

If the MDA finds an emergency exists requiring immediate action to protect ground water from agricultural chemicals or to prevent use of ground water impaired or likely to be impaired by agricultural chemicals, the MDA may, without notice or hearing, issue necessary orders or adopt rules to protect public health, welfare, and safety 80-15-405, MCA. Duration of such an order is limited to the emergency provisions of the Montana Administrative Procedure Act as specified in ARM 2.4.303.

Compliance With Management Plans

Persons using an agricultural chemical are required to comply with the provisions of any SMP or PSMP adopted under the authority of the MACGWPA. Failure to comply with a SMP or PSMP is a violation of MACGWPA. Those persons found in violation of a PSMP, compliance order, or any provision of the MACGWPA are subject to administrative (80-15-412, MCA), judicial (80-15-413, MCA), and/or criminal penalties (80-15-414, MCA). A compliance order can be issued to any person (whether or not that person is subject to a PSMP) violating a standard, an interim numerical standard, or any other requirement established pursuant to a PSMP, 80-15-403, MCA. A compliance order may require a person to clean up any agricultural chemical that the person has accidentally or purposely dumped, spilled, misused, or unlawfully used that has a significant probability of entering ground water. Monitoring can be required to determine residue levels, trends and movement of agricultural chemicals in ground water, soils, or other materials.

Evaluation and Modifications to Management Plans

The Department must periodically review agricultural chemical ground water management plans to determine if requirements contained in the plans need to be modified based on new scientific data and information. Changes to a PSMP must be made in compliance with Title 80, chapter 15, MCA and must be accomplished by rulemaking (80-15-217(2), MCA).

Modifications in Authority Needed to Enhance the PSMP Process

State agencies with responsibilities for pesticides and ground water have sufficient legal authority to develop, implement and enforce PSMPs. At this time, the MDA does not feel that any modifications in authority are necessary.

Resources

Technical Expertise

Montana has been involved in a broad scope of water resource protection activities since 1967. Through the evolution of the water planning process, coordination and cooperation within and between agencies and groups has developed to a degree which has resulted in a comprehensive approach to water resource management. Ground water management plans (SMPs and PSMPs) became apart of the ground water resource planning process in 1991 through the enactment of the Montana Agricultural Chemical Ground Water Protection Act (MACGWPA). As described in component 2, each agency or group is responsible for a specific aspect or aspects of water resource management and protection. Technical expertise to carry out these functions and activities is associated with the respective agency or group. Each management plan will be specific to the pesticide(s) in question and the county or counties in which it is (they are) used within the state. Each plan, while having similar components, will differ for these reasons and therefore the technical expertise needed or desired may also differ for each plan. However, It is anticipated that, at a minimum, certain categories of expertise will be needed to address PSMPs.

Described below are the categories of technical expertise available from the core PSMP group. Expertise may also be available from other agencies or groups. Many of the PSMP component requirements are currently being addressed under work currently carried out by the various agencies and groups. When a particular need or requirement is or has not been met under current work plans, efforts will be made to address that need with the specific agency or group having the technical expertise to satisfy the need. Established cooperative working relationships, development of work agreements and/or contractual agreements, allocation of funds from the Department and MOUs will be depended upon to retain the technical expertise determined to be necessary for plan development and implementation success. Periodic review of personnel and technical expertise needs will identify if additional personnel and technical expertise are necessary.

Montana Department of Agriculture

The Montana Department of Agriculture (MDA) will be administering the development and implementation of ground water management plans. Personnel that are directly involved in ground water resource activities and/or will be involved in development and implementation of ground water management plans include:

- 1 ground water specialist
- 1 ground water enforcement specialist
- 1 soil scientist specialist
- 2 ground water chemists
- 1 weed/pesticide specialists
- 1 insect/pesticide specialist
- 5 field pesticide specialists
- 1 laboratory ground water technician

1 geographical information system specialist
1 agricultural specialist
2 program coordinators
3 bureau chiefs
1 administrator

Individual involvement in management plan development and implementation will vary according to the level of management plan intensity, number of management plans in place as well as other program demands.

The Department also has 1 registration specialist, 1 training/education specialist, 4 chemists, 2 chemist technicians, a statistical staff, 6 administrator support personnel, 1 attorney, and 0.5 to 0.75 FTE general program support personnel that are indirectly involved or that support the ground water program administration and may be involved in development and implementation of ground water management plans. The Department's main office is augmented by 8 field offices located in Big Fork, Billings, Bozeman, Glasgow, Great Falls, Missoula, Plains and Saco. The degree of involvement will depend upon the individual ground water management plan in question and the level of plan management intensity as well as other program demands.

Montana Department of Environmental Quality

The Montana Department of Environmental Quality (DEQ) will be responsible for initial assessment needs of PSMPs as a PSMP core group member, serve as a member of the PSMP Voluntary Advisory Committee and will formally review all PSMPs prior to publication and adoption as rule. In addition, the DEQ may gather data necessary for decision making and the support of PSMP development and implementation. The DEQ has the following categories of expertise available which may be used to assess, develop and implement PSMPs:

Hydrogeologists
Geologists
Soil Scientists
Chemists
Education and Training Specialists
Field Inspectors and Investigators
Environmental Permitting and Compliance Specialists
Water Quality Specialists
Surface Water Specialists
Ground Water Specialists
Public Water Supply Specialists
Water Quality Enforcement Specialists
Environmental Enforcement Specialists
Remediation/Reclamation Specialists
Planning, Prevention and Assistance Specialists (Environmental Resource Protection, Planning, Local Government Assistance and Pollution Prevention)

The DEQ is supported by an administrative management staff and the Board of Environmental Review and a number of attorneys. The Board of Environmental Review is responsible for adoption of health based standards for water resources, both surface and ground water. The DEQ's main office is located in Helena, MT but also has Billings, Kalispell and Polson Field Offices.

Montana Department of Natural Resource and Conservation

The Department of Natural Resource and Conservation (DNRC) will act as a PSMP core assessment and Voluntary Advisory Committee member. There are Conservation, Resource, Range, Forestry, Land Management and Right-of-Way Specialists, a GIS specialist and Wildlife Biologist as well as a number of Hydrologists, Soil Scientists, Civil Engineers, Forest Planners and Field Technicians. DNRC staff is distributed between the offices in Helena and field offices located in Anaconda, Billings, Bozeman, Clearwater, Condon, Conrad, Dillon, Garrison, Glasgow, Glendive, Hamilton, Havre, Kalispell, Lewistown, Libby, Lima, Lincoln, Marion, Miles City, Missoula, Plains, Plentywood, Polson, Roundup, Shelby, Stillwater, Swan River and Toston. The Montana Water Course, a DNRC program located in Bozeman, is staffed by a program manager and an education specialist. Conservation Districts are administered under the DNRC. The DNRC is supported by a number of programmatic staff members and legal council. Representation from the DNRC will provide expertise at a number of critical levels e.g., local, regional and state.

Montana Bureau of Mines and Geology

Under PSMPs, the Montana Bureau of Mines and Geology (MBMG) will provide geologic, hydrologic, hydrogeologic, soils and water quality expertise. MBMG staff are experienced in ground water, surface water, water quality, public water supply, field investigation, research, hydrology, hydrogeology and soils. The MBMG also has a GIS specialist, a number of chemists, water resource database specialists, laboratory analysts, and a hydrogeologist staff member certified as a well driller. MBMG's Analytical Division is capable of analyzing solid and aqueous materials for a variety of materials including inorganics, organics, petroleum hydrocarbons and radioactive materials. Housed at the MBMG, the Ground Water Information Center (GWIC) database serves as an important source of information on well logs, drilling and ground water quality information. Legislatively charged with administration of the Assessment Program, the MBMG has a number of qualified staff dedicated to conducting ground water quality, vulnerability and sensitivity assessment work. The MBMG will participate in PSMPs as a member of the core assessment group, as a Voluntary Advisory Member and by conducting hydrogeologic investigation in support of PSMP development and implementation.

Montana State University (MSU)

The Montana State University (MSU) Agricultural Experiment Station (MSU AES) and Montana State University Extension Service (MSU ES), both, serve an important role in PSMPs. MSU, MSU AES and MSU ES have elected to have one individual represent all entities in the PSMP process. Montana State University is a land grant research and education institution with educational (MSU), research (MSU AES), and outreach (MSU ES) responsibilities. Included among the areas of specialty are crops and cropping, irrigation, tillage, farming practices, pesticides, soils, water, watershed, geology, hydrogeology, water quality, ground water, surface water, conservation, education and training, GIS, fertilizers and chemistry. As such MSU, MSU AES and MSU ES will be a tremendous resource from which PMSP assessment, development and implementation will benefit. MSU, with the main campus located in Bozeman, has seven Agricultural Research Centers located at Corvallis (Western), Conrad (Western Triangle), Kalispell (North Western), Mocassin

(Central), Sidney (Eastern), Huntley (Southern) and Havre (Northern) and 49 Extension offices located throughout Montana. The Chemistry Station Analytical Laboratory serves both MSU and MDA needs. Laboratory capabilities include analytical analysis of a variety of media for inorganic, organic and environmental contaminants as well as livestock, feed, fertilizer and environmental material conditions and content. MSU also houses a Soil, Plant and Water Analytical Testing Laboratory.

Natural Resource Conservation Service

Categories of expertise available from the NRCS include soil scientists, technicians and conservationists; agronomists; biologists; wetlands experts; engineers; hydrologists; geologists; watershed planners; rangeland management specialists; water supply specialists; education/training specialists; Database specialists; GIS specialists; cartographers and technicians; and surface and ground water specialists. The NRCS serves Montana through a state office, 12 multi-county teams 4 to 6 counties in size and 86 offices designated as support, field, conservation and development, soil survey or watershed offices. The NRCS has agreed to become a core assessment group and the Voluntary Advisory Committee member.

United States Geological Survey

The USGS National Water-Quality laboratory in Denver is capable of analyzing a variety of media for environmental parameters and constituents and contaminants. In Montana, USGS, generally, uses its own drill rigs and crews but may also contract with local well drillers. Staff includes hydrologists and hydrologic technicians with expertise in surface water hydrology, hydrogeology, geology, water quality, data management, and GIS. The USGS will be an integral part of the core assessment group and the Voluntary Advisory Committee in assessing the need for the development and implementation of PSMPs.

Anticipated Costs for a PSMP

Costs associated with the development, implementation and maintenance of PSMPs will be borne by state agency funding and by federal grant funds received for that purpose. Exact figures for future projections and anticipated costs cannot be given. The State, at this time, cannot predict costs nor can the State account financially for unforeseen problems which could alter a proposed estimate. Once the State has experience in developing and monitoring management plans, cost estimates can be determined. Additionally, costs for PSMPs will vary with the expected level of beneficial usage of the pesticide in question and according to the degree of management necessary. Degree of management will depend, in part, upon the compounds in question, the geographical areas of use and hydrogeological considerations. Costs will be anticipated in the following areas: plan development and implementation, preventive measures, vulnerability assessments, public education, promotion of public participation, monitoring, response to detections, laboratory analysis, compliance and enforcement, record-keeping and reporting. When PSMPs overlap geographically, reduction in management costs are anticipated.

Funding

Funding for the MDA is through state special registration and training revenues and EPA cooperative agreement funds. A portion of these fees are currently used for monitoring activities involving pesticides in ground water.

Water resources programs administered by DEQ are funded by Clean Water Act (CWA) section 319 and 106 and Safe Drinking Water Act (SDWA) monies. Ground water projects conducted by MBMG as well as others have been supported by CWA 319 monies. Work undertaken by these agencies may benefit ground water protection efforts pursued under PSMPs. It is also recognized that Clean Water Act, Section 319, monies could be utilized to address specific PSMP objectives or activities. However, 319 monies are not intended for long-term, on-going work. While the department may be able to obtain 319 funding for specific projects pertaining to PSMPs, such funding cannot be relied upon as a consistent funding source.

Current authority to generate funding for management of PSMPs is limited to pesticides registration fees and EPA grant funding. The Department is committed to pursuing alternative and additional funding sources if appropriate funding sources are identified and become available and when the Department can meet the requirements for such funding. At present, no other funding sources exist for protecting ground water from pesticide contamination.

When PSMP development and implementation is dependent upon limited or inadequate funding, the MDA will prioritize preparation of SMPs and PSMPs by considering the specific circumstances of each area, the anticipated continued need for the chemical usage, and the potential for ground water impairment.

Cited References

Montana. State of. 1994. "Roles and Responsibilities: United States Geological Survey (USGS)." *In:* Montana Agricultural Chemical Ground Water Protection Plan, pg 72. Montana Department of Agricultural, Helena, MT

Assessment and Planning

Initial Assessment

Once the decision to develop a PSMP has been made, an initial assessment will be conducted by MDA, DEQ, DNRC, MBMG, USGS, NRCS, MSU and EPA. Most management plans are not expected to be addressed on a state-wide basis but rather, will be specific to the areas where the chemical is used and/or where ground water is vulnerable. The initial assessment will determine if the type and extent of information for the identified PSMP area that will be required to develop and implement the plan is available. Upon completion of the initial assessment, a voluntary PSMP Advisory Committee will be developed to make recommendations for the development and implementation of the PSMP.

After the necessary types of information identified in the initial review have been gathered, a determination of adequacy will be made. Determinations of adequacy will fall within one of three categories:

1. All necessary information is available; the information is adequate for the development and implementation of a plan;
2. Information is available but is inadequate for the development and implementation of a plan;
3. Necessary information is not available.

When all necessary types of information are available and adequate, plan development will proceed. When information is not available or inadequate to address the requirements of a plan, gaps in available information will be identified. When data required can be gathered, collected or otherwise satisfied within reasonable limits (within available funding, personnel and time limits), an outline of the means for acquiring the data will be developed and implemented. At the same time, plans for the development of a management plan will proceed. When necessary types of information are not available or inadequate but the data required can not be gathered, collected or otherwise satisfied within reasonable limits, the best available data or information will be used and plans for the development of a management plan will proceed. Best available data or information *may* include information of a similar but not exact nature, professional judgement, and/or the use of models. When such a situation occurs, it will be noted in the management plan.

Interagency cooperation through a voluntary advisory committee will be relied upon to fully address all ground water and agricultural chemical issues relating to development, implementation, management, evaluation and periodic review of management plans. Each plan will share similar components but will differ in its initial review, design, planning, development and evaluative strategy because of each pesticide's distinctive qualities and the unique characteristics of each area.

Sources of Information	
Data or Information	*How Data and Information Will Be Used*
USDA-NRCS	
National Soil Surveys	Detailed soils information will be used for land use planning and vulnerability determination.
Crops/Cropping rotations	Cropping information will be used to determine pesticide use locations and vulnerability determinations.
Pesticide usage	Pesticide usage data will be used for planning purposes; in determining field by field pesticide usage, in selecting analytes for sampling and monitoring and in making vulnerability assessments.
Irrigation data & information	Irrigation data and information will be used to develop hydrologic budgets, enhancing understanding of hydrologic dynamics, estimating leaching potential, and in assessing vulnerability.
Aerial maps	Aerial maps will be used to delineate agricultural cropping fields.
EPIC Model	EPIC model can provide single-site general moisture predictability and groundwater vulnerability determination as long as local soils, climate, and crop information are available and the Montana version of EPIC is used.
NLEAP Model	NLEAP is a nitrate leaching and economic analysis model providing single site general groundwater vulnerability. This model can be used to estimate seasonal nitrate leaching during frost free and snow free periods, provided that initial moisture conditions are known.
USDA-ARS	
Pesticides Properties Database	The pesticides properties database provides information on pesticide characteristics (sorption, solubility, soil half-life, GUS values, etc.) which can be used to calculate leaching potential.
USGS	
Interpretive information	Depending upon area of interest, detailed interpretive information may be available in published reports, maps and GIS coverages. Information may include, for example, maps showing aquifer geometry, explanations of complex geochemical interactions that might be occurring in a particular area, or delineations of ground-water flow paths based on age-dating of water using CFCs (chlorofluorocarbons) and isotopes. Aquifer data, information and maps will be used to identify and delineate aquifer locations, determine water quality of existing aquifers and to determine aquifer sensitivity using geologic and soils information. Information and data will be used to determine if hydrologic connection with ground and surface water exists, to identify location and aerial extent of recharge areas and areas of influence for wells serving as drinking water sources. Information may also be used in designing the monitoring component of management plans.

WATSTORE database	Baseline groundwater data which may include information on well inventory data, water levels, aquifer properties and ground-water quality data. Data will be used to determine intrinsic sensitivity of aquifers.
DEQ	
Aquifer data, information and maps	Aquifer data, information and maps will be used in identifying and delineating aquifers
Ground water classification	Ground water classification information will be used to determine the current and anticipated beneficial uses of groundwater within a PSMP area.
Water quality	Information and data on water quality and contamination types will be used to design and develop management plan sampling and monitoring programs.
Ground water standards	Establishment of pesticide standards for ground water will serve as prevention and response mechanisms.
Source Water Program	The Source Water Program will identify and delineate potential sources of contamination for a particular aquifer.
Wellhead Protection Program	The Wellhead Protection Program will be used to identify and delineate well locations, wellhead zones of influence and potential contamination sources. The resulting information will provide a basis for the development of management practices to prevent contamination.
Public water supply sampling data	Public water supply sampling data will determine the need for and the evaluation of prevention and response strategies.
MBMG	
Aquifer data, information and maps	Aquifer data, information and maps will be used to identify and delineate aquifers, determine water quality of existing aquifers and will be used with geologic and soils information to determine aquifer sensitivity. Information and data will also be used to determine if hydrologic connection with other ground and surface water exists.
Ground water quality data	Ground water characterization and hydrologic data will be used to determine sensitivity. Ground water use data will be used to assess vulnerability. Water quality and quantity will be used to assist in designing, ground water sampling and monitoring components of PSMP.
Ground Water Assessment Program	The Ground Water Assessment Program goal is to provide vulnerability and sensitivity information through a systematic assessment of Montana aquifers and hydrologic regimes. The program will also provide valuable information on ground water depth, flow and direction, type of bedrock, aquifer materials and overlying vadose zone materials. Information will also be used to establish a monitoring program where data is lacking or insufficient for making management decisions and to augment the sampling and monitoring design.
Geologic data and maps (many of which are digitized)	Geologic data and maps will be used to determine aquifer sensitivity.

GWIC	The Ground Water Information Center (GWIC) is a state repository for water well data and contains information on wells (construction, date of well construction, lithology, static water levels and location) as well as other ground water data generated by well drillers and scientists - such as depth to ground water, aquifer data, and water quality. Well data will be used for selection of wells for inclusion into sampling and monitoring programs.
State Map Program	The State Map Program is a geologic mapping program producing maps with a 1:100,000 scale. Maps will be used to evaluate ground water sensitivity.
<u>DNRC</u>	
Conservation and Resource Development Division	The Division will provide a communication link between conservation districts and other management plan agencies
Water Rights Database	The database includes information on all water rights; both ground and surface water sources. The information within the database could include identification of sources for municipal and other drinking water supplies and to establish priorities for management plans.
Hydrologic, soil and land use analysis information	Vulnerability assessments will include hydrologic, soil and land use data available from DNRC.
<u>MSU/MSU AES/MSU ES</u>	
Published agriculture information and data on crops, irrigation, pesticides, fertilizers, geology, hydrology, soils, water quality	Crop and cropping information will be used to assist in gross identification of pesticide use areas. Along with other agency information and data, geologic and hydrologic information will be used to assist in determining sensitivity and vulnerability of groundwater within management plan areas. Pesticide information will form the basis for characterizing and predicting expected fate and transport of pesticides in Montana environments. When irrigation data and information is available, it will be used to develop hydrologic budgets, enhance understanding of hydrologic dynamics, used in estimating leaching potential and in assessing vulnerability. MSU AES may, under controlled conditions for a pesticide and its metabolites, conduct studies with soil columns extracted from a site to model pesticide fate and transport. Studies would initially use published information on pesticide properties (half-life, K_{oc}) and computer models to predict depth of movement and potential concentrations by depth based on basic published soil properties. Information could then be entered into computer models which would integrate short and long-term climatic factors and soil survey information for more site-specific vulnerability prediction capabilities on a larger geographic scale. The MSU AES data are generated under controlled conditions (soil, water, temperature, etc.). Some work after the preliminary research has been conducted could be taken to the field for field validation. MSU ES conducts information/education programs throughout Montana with fact sheets, bulletins and videos published by MSU faculty and others. The information is science-based, relevant to the situation and transformed into usable components for a targeted audience. The adult education programs strive to provide background and in-depth information so that the ability to make more informed decisions on pesticide use and management is enhanced.

Farm*A*Syst	Farm*A*Syst provides producers and growers with a means of evaluating their operations and voluntarily implementing management changes and adopting BMPs.
MDA	
Pesticide information and data	Registrant labels provide pesticide use and application information. Information and data will be used to assure the appropriate use(s) of pesticides through inspections, compliance assistance and investigations.
Pesticide sales data	Sales data from dealers and distributors will be used to determine and monitor the volume of pesticides used in Montana. Pesticide sales information may also provide information of the location of pesticide mixing/loading and storage facilities.
Pesticide applicator records	Pesticide applicator records will provide detailed information of use patterns and locations within the state.
Ground water pesticide sampling and monitoring data and information	Sampling and monitoring data will be used to design and modify monitoring programs, allow tracking of concentrations in ground water and provide a mechanism to evaluate prevention and management strategies.
RAVE (Relative Aquifer Vulnerability Evaluation)	RAVE will be used as a training tool to enhance in-field vulnerability assessment by pesticide users.
Montana Conservation Districts	
Crop/cropping, pesticide use, land use, irrigation use	Crops and cropping information, land use information and data and irrigation data will be used in evaluating ground water vulnerability.

Assessment and Planning Limitations

The State, at this time, has not identified any assessment and planning limitations.

Monitoring Program

Objective

Monitoring will be an integral component of all PSMPs. The objective of PSMP monitoring will be to assess ground water quality and evaluate effectiveness of management plan strategies in preventing ground water contamination and mitigating any existing and future contamination. An initial review of existing data and information and an evaluation of the existing monitoring program will be conducted prior to establishing a monitoring program under a PSMP. The PSMP monitoring objective will be accomplished through baseline, response and evaluative sampling. The objective of baseline sampling will be used to establish baseline information and to determine if contamination exists. Response monitoring will include verification, follow-up and investigatory sampling. Evaluative monitoring will be used to determine if prevention measures are providing adequate protection of ground water resources and to assure compliance with the management plan measures, restrictions, policies and regulations.

Scope

Monitoring will be tailored to the specifics of each PSMP. Sampling will occur within the geographical boundaries of a PSMP. Monitoring and sampling *may* occur outside a PSMP boundary if ground water resources extend beyond the geographical PSMP boundary. The state will target monitoring efforts to the identified pesticide(s) and areas of known use. Monitoring will be further focused in those areas known or thought to be sensitive and vulnerable. Monitoring could be local, regional or statewide in nature. Monitoring scope will be dependent upon what's known of the hydrogeological environment, crops and cropping practices, pesticide use, known or expected pesticide behavior in the specific Montana environment and available ground water monitoring information and data. Scope of monitoring may change over time to meet the needs of the plan. For example, initial monitoring efforts may focus on establishing baseline information in areas where there is no data or where data is insufficient to adequately assess the PSMP areas. Later, monitoring efforts could be modified to address more vulnerable areas, assess impaired areas identified under baseline monitoring and to evaluate prevention measures.

Design and Justification

Monitoring and sampling will be focused in those areas where the pesticide in question is being used. Distribution of monitoring and sampling sites will depend upon use areas, location of ground water, water usage and vulnerability and sensitivity of the ground water resources. Criteria for selection of monitoring sites are outlined in the Administrative Rules for the MACGWPA (4.11.602, ARM). They include the following:

1. Local cropping practices;
2. Agricultural chemical use patterns;
3. Soil characteristics;
4. Depth to water table;
5. Ground water usage;
6. Existing water quality;
7. Number of wells per unit area;
8. Previous detections of agricultural chemical residues in ground water;
9. The potential for adverse impact of impaired or degraded ground water on human health or the environment;
10. Agricultural chemical user activities which may lead to ground water impairment or degradation;
11. Suspected misuse of chemicals, violation of Title 80, Chapter 15, MCA, or violation of a PSMP.

Once the appropriate number of sites to be monitored under a management plan and number of wells per site to be included in the monitoring program are determined, suitability of existing wells will be evaluated. The type, number, and location of sampling points (wells) considered for any monitoring plan will depend a great deal on the amount of pesticide usage, geographical location of chemical usage, availability of existing wells, suitability of existing wells, chemical and physical pesticide characteristics (binding characteristic and leaching potential), the soil and geology and aquifer characteristics. Established wells meeting monitoring criteria will be used whenever possible. Well selection criteria will include: well construction and condition, lithology, depth to ground water, screened interval, aquifer(s) perforation (does the well perforate the aquifer of concern, does the well perforate more than one aquifer, and if the well does perforate more than one aquifer, are the two aquifers connected through the screened interval), use, water treatment, location of principal sampling point, access, and cooperation of well owner. Drilling and installation of wells will be considered only when existing wells have inadequate construction and/or insufficient lithology, established wells do not provide good representation or distribution of the area of concern or where wells are not extant. Drilling and installation of monitoring wells will follow Montana Board of Water Well Contractor guidelines and the criteria agreed upon by the core assessment group. All drilling, installation and development of monitoring wells will be done by contractors. Consultation with monitoring well installation experts will be sought prior to specifying well drilling details in contracts.

A monitoring scheme may evolve from the point of initial monitoring or any time thereafter, depending upon the management level desired under a PSMP. Therefore, monitoring components will be reviewed periodically and, based on results of sampling and monitoring activities, will be amended as necessary to provide the best management possible under a PSMP.

Frequency of sampling and monitoring activities will depend, in part, on:

- whether monitoring data for the PSMP area exists,

- the quality of the existing data.
- whether the pesticide has previously been detected (and verified) in ground water,
- if the pesticide has previously been found in ground water, the frequency, concentration and movement of the agricultural chemical,
- whether the pesticide has been determined to have a high probability, based on best available scientifically valid evidence, to impair ground water,
- whether the pesticide is being used in an area known to have a high vulnerability and sensitivity to impairment from agricultural chemicals,
- the quality, use, and value of the ground water,
- the number of individuals that could potentially be affected by the impairment of the ground water, and
- financial resources.

Monitoring Protocols

Monitoring and sampling efforts under management plans will be reflective of the needs of each individual plan. PSMP monitoring strategies will be specific to the chemical in question, the geographical area(s) in which the chemical is used or is restricted to, sensitive/vulnerable areas within the PSMP boundaries and will conform to EPA management plan requirements. Baseline, response and evaluative monitoring will be conducted under PSMPs in Montana. The state will recommend adoption of the EPA's "Minimum Set of Data Elements" for ground water quality data collection activities.

Baseline Monitoring

Baseline monitoring will be used to establish existing water quality and to assess whether impairment of ground water resources has occurred. Sampling under baseline monitoring will be local, regional or statewide in nature dependent upon pesticide usage within the state. Design of baseline monitoring will be dependent upon whether baseline data exists and the quality of available data; whether the data provides sufficient coverage and good representation of the PSMP area. Established wells will be used whenever possible. See Design and Justification for information on well selection. Frequency and timing of baseline sampling will initially be conducted on a quarterly or modified-quarterly basis. Modified quarterly sampling consists of three to four sampling events conducted per year - prior to pesticide application (spring) , 1 to 4 weeks after pesticide applications occur (dependent upon depth to ground water, vulnerability of aquifer, irrigation/precipitation type and amount, leaching potential of pesticide and soil materials), mid- to late in the growing season (usually September or early October). Location of monitoring sites, sampling frequency and timing and analyte selection may later be adjusted to better reflect the vulnerability of the area, changing cropping and pesticide usage and monitoring needs or concerns.

Response Monitoring

It is the policy of the MDA to conduct response monitoring whenever other types of sampling have resulted in a detection. Response monitoring will be an integral component of all monitoring programs and projects. Response monitoring will be used to 1) verify an initial

detection of pesticide(s) in ground water; 2) track concentration levels; 3) expand sampling to determine scope, extent and source of impairment; 4) investigate complaints and/or and determine allocation of responsibility. The scope of monitoring may be regional but more than likely will be local in nature. Design of monitoring will be dependent upon the type and purpose of the monitoring. Verification and follow-up sampling will utilize the well or wells from which the initial ground water sample(s) was collected. All existing wells in the area of concern will be considered for inclusion when conducting an expanded sampling. Existing wells will be evaluated to determine their suitability for use in sampling. See Design and Justification for information on well selection. Both compliance and investigatory monitoring may utilize extant wells or install monitoring wells to fully address the issues.

The State will follow the procedures specified in the Response component (Component 8). Intensity of measures may increase as described in the Prevention component (Component 7). Management monitoring may:

1. Necessitate expansion of drinking water well testing to determine if an immediate public health threat exists due to ground water contamination.
2. Require additional sampling and monitoring to determine the effectiveness of the monitoring requirements under a PSMP.
3. Require review of assessment/vulnerability elements in relation to existing monitoring data.
4. Involve revision of the existing monitoring scheme or plan.

Detections in ground water samples will trigger verification sampling. Verification sampling will be conducted within 30 days of receipt of sampling results indicating a pesticide detection. Results indicating a detection for a pesticide in ground water being used for drinking water will be re-sampled within 10 days to verify the presence of the pesticide.

Once a pesticide is detected in ground water, ground water monitoring will be conducted to determine the cause and extent of the problem. When pesticide detections in ground water are verified, the well will be placed on follow-up sampling. Follow-up sampling will occur three to four times a year, depending upon weather conditions. If weather and travel conditions permit, four samples will be taken - spring (pre-application period), post-application, mid-season and late season (October - November). Sampling frequency will be reviewed periodically and may be adjusted on an individual basis. For example, positive detections in the Devon area were conducted on a quarterly basis for the first two years but have since been reduced to three sampling events per year because voluntary corrective actions have reduced the concentration of the pesticides, levels are very low and are decreasing, are not migrating and impacting other wells and water is not being used for drinking water. Conversely, positive detections on the Greenfields Bench were initially sampled on a quarterly basis but due to hydrologic conditions were sampled on a monthly basis for one year in an effort to better understand the nature of the hydrologic system and to determine appropriate future sampling frequency and timing. Sampling is currently being conducted on a modified quarterly basis again and future sampling frequency and timing could be further refined as a better understanding of the area is achieved.

Evaluative Monitoring

Evaluation monitoring will be conducted under a PSMP to evaluate the effectiveness of the management plan and to ensure compliance with the plan. Evaluation monitoring will be conducted on a site-specific basis and decisions regarding evaluation monitoring will, necessarily, be made on a case-by-case basis. Generally, site selection will be based upon geographical pesticide usage. Selection of specific sites will be based upon the site geology, aquifer characteristics and depth, and pesticide characteristics and evaluation of the suitability of existing wells. Evaluative monitoring frequency and timing, distribution, location and number of wells to be monitored will be based on the sensitivity/vulnerability, cropping, pesticide use (amount used per application, total yearly amount applied and application type), ground water depth, potential for pesticide leaching and value and use of groundwater. Evaluative monitoring may be conducted by the MDA, DEQ, MBMG, USGS or other agencies or may be required by pesticide registrants or pesticide users (individuals).

Quality Assurance/Quality Control (QA/QC)

A critical component of monitoring is Quality Assurance/Quality Control (QA/QC) procedures. The basis for reliability is performance of sampling and analysis under strict QA/QC procedures consistent with EPA directives, and use of validated analytical methods including confirmation analysis. Under PSMPs, agencies will adhere to strict QA/QC guidelines and will, therefore, be able to respond to detections with a high level of confidence and comparability of data.

The objective of the QA/QC is to assure that analytical data in terms of precision, accuracy, completeness, representativeness and comparability, produce results that are reliable, scientifically sound, defensible, and reflective of state-of-the-art methodology. Ultimately each analytical result or set of results generated in support of the pesticide and ground water programs should be fully defensible in any legal action, whether administrative, civil or criminal in nature. The QA portion of a ground water quality assurance plan generally establishes the specific goals and objectives of the plan. The QC establishes the specific procedures to be used in the plan to achieve the goals.

Quality Assurance Plan

A pesticide cooperative enforcement agreement was developed between the MDA and the EPA under section 23 of the FIFRA. Two of the components of the cooperative enforcement agreement were to develop pesticide enforcement and ground water protection programs. In both of these programs the MDA is following established QA/QC.

The MACGWPA authorizes MDA to establish and maintain ground water monitoring and enforcement programs for pesticides and other agricultural chemicals. QA/QC measures have been established to assure that standards of precision, accuracy, representativeness, completeness and comparability are met. Montana's Quality Assurance Project Plan has been approved by EPA Region VIII.

Documentation Of Physical Samples For Evidence

The QAPP and SOPs contain detailed descriptions of the requirements and procedures for documentation of physical samples.

Laboratory Operations

All ground water samples collected by MDA for pesticide analysis are analyzed by the MDA Laboratory Bureau. The MDA laboratory may also analyze materials other than ground water. Procedures and protocols are specified in the Montana Laboratory Standard Operating Procedures for the Montana Department of Agriculture, Agricultural Sciences Division, Laboratory Bureau (MDA, n.d.) but are not described herein. Other agencies that conduct monitoring do not necessarily utilize the MDA Laboratory. When agencies utilize other laboratories, specific QA/QC protocols may differ. Only data generated from other laboratories that conform to EPA minimum QA/QC requirements will be used for PSMP purposes. The following briefly describes the Quality Assurance and Quality Control aspects of the laboratory for ground water sampling and monitoring.

Laboratory Quality Assurance Project Plan (QAPP)

Ground water sample analysis related to agricultural chemicals is one of the responsibilities of the MDA. Methodology and established QA/QC procedures used for ground water sample analysis are described as follows: project plan identification form; project plan approval form; project description; project organization and responsibilities; quality assurance objectives for measurement data in terms of precision, accuracy, completeness, representativeness and comparability, sampling procedures, sample custody, calibration procedures and frequency, analytical procedures, data reduction, validation and reporting; internal quality control checks, performance and systems audits; preventative maintenance; specific routine procedures used to assess data precision, accuracy and completeness; corrective action; and quality assurance reports to management.

Analytical Methods

The MDA Laboratory uses EPA multi-residue methods for ground water analysis when available. QC procedures specific to the EPA method are followed. If EPA methods are not available, company, in-house or professionally accepted methods are used and QC procedures are specified in the methods and/or the QAPP is followed. Positive results for each sample are confirmed using a different column and/or detector or another technique (i.e., GC/MS). The analytes may change based on use patterns and needs in the field. Analytical methods may change due to new technology. Method detection limits are established by the method, and are only a guidance and may vary due to sample matrix interference. Analytical methods, analytes and detection limits for pesticides in groundwater are:

Analytical Method, Analytes and Method Detection Limits for Pesticides in Groundwater

Abbreviated Method Name: Atrazine and Metribuzin Metabolites for Water
Method Reference: Liquid Chromatographic Determination of Pesticides in Finished Drinking Water: Collaborative Study. J. Assoc. Off. Anal. Chem, 75858 (1992) with in-house modifications.
Method Detection Limit is listed as ppb (μg/L); * by GC Method

Dealkyl Atrazine*	0.10 - 0.50	Deethyl Atrazine	1.00	DADK Metribuzin	2.50
Deisopropyl Atrazine*	0.10 - 0.50	Deisoproply Atrazine	1.00	DK Metribuzin	0.50
Deethyl Atrazine*	0.10 - 0.30	DA Metribuzin	1.00		

Abbreviated Method Name: Carbamate MRM for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, Method Number 531.1: Measurement of N-methylcarbanoxyloximes and N-methyl-carbamates in Ground Water by Direct Aqueous Injection HPLC with Post Column Derivitization, Revision No. 3.0.
Method Detection Limit is listed as ppb (μg/L).

3-Hydroxycarbofuran	2.00	Aldicarb Sulfoxide	2.00	Carbofuran	1.50
Aldicarb	1.00	Carbaryl	2.00	Methomyl	0.50
Aldicarb Sulfone	2.00				

Abbreviated Method Name: CH MRM for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, Method Number 508: Determination of Chlorinated Pesticides in Ground Water by Gas Chromatography With An Electron Capture Detector, Revision No. 3.
Method Detection Limit is listed as ppb (μg/L).

Aldrin	0.075	Endosulfan II	0.024	Methoxychlor	0.050
Chlordane (alpha)	0.0030	Endosulfan Sulfate	0.015	Permethrin (cis)	0.50
Chlordane (gamma)	0.0030	Endrin	0.015	Permethrin (trans)	0.50
Chloroneb	0.50	Endrin Aldehyde	0.025	p,p'-DDD	0.0050
Chlorothalonil	0.025	Heptachlor	0.010	p,p'-DDE	0.010
DCPA	0.025	Heptachlor Epoxide	0.015	p,p'-DDT	0.060
Dieldrin	0.020	Hexachlorobenzene	0.0077	Trifluralin	0.025
Endosulfan I	0.015	Lindane	0.015	Toxaphene	1.00

Abbreviated Method Name: Chlorsulfuron &/or Sulfometuron methyl for water
Method Reference: Dupont deNemours Inc.'s Analysis of Sulfonylureas in Water by Liquid Chromatography, doc. No. AMR-356-85A, Revised 2/13/86.
Method Detection Limit is listed as ppb (μg/L).

Chlorsulfuron	0.10	Sulfometuron methyl	0.10	

Abbreviated Method Name: EDB and DBCP for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, Method Number 504: 1,2-Dibromoethane (EDB) and 1,2-Dibromo-3-Chloropropane (DBCP) in Water by Microextraction and Gas Chromatography, Revision No. 2.
Method Detection Limit is listed as ppb (μg/L).

Dibromochloropropane (DBCP)	0.025	Ethylene Dibromide (EDB)	0.025	

Abbreviated Method Name: Glyphosate for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, EPA Method Number 547: Determination of Glyphosate in Drinking Water by Direct Aqueous Injection HPLC, Post-Column Derivitization and Fluorescence Detection (July 1990).
Method Detection Limit is listed as ppb (μg/L).

AMPA	9.0	Glyphosate	9.0		

Abbreviated Method Name: IMID MRM for water
Method Reference: Montana Department of Agriculture, 1997, Multiresidue Method for the Determination of Imidizolinones in Water.
Method Detection Limit is listed as ppb (μg/L).

Imazamethabenz-methyl acid metabolite Imazamethabenz-methyl	0.20 0.20	Imazapyr	0.20	Imazethapyr	0.20

Abbreviated Method Name: Metsulfuron methyl and/or Chlorimuron Ethyl for water.
Method Reference: DuPont deNemours Inc.'s Analysis of Sulfonylureas in Water by Liquid Chromatography, Doc. No. AMR 356-85A, Revised 2/13/86.
Method Detection Limit is listed as ppb (μg/L).

Chlorimuron Ethyl	0.10	Metsulfuron Methyl	0.10		

Abbreviated Method Name: NO_2_W1 and Nitrate/Nitrite for and soil
Method Reference: Montana Department of Agriculture's Determination of Nitrate and Nitrite in Water Utilizing Ion-Chromatography.
Method Detection Limit is listed as ppb (μg/L).

Nitrate	1.00	Nitrite	0.10	Nitrate & Nitrite-N in soil	10,000.00

Abbreviated Method Name: Nitrogen MRM for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, Method Number 507: Determination of Nitrogen and Phosphorus-Containing Pesticides in Ground Water by Gas Chromatography with a Nitrogen-Phosphorus, Revision No. 2
Method Detection Limit is listed as ppb (μg/L).

Acetochlor	0.50	Cycloate	0.25	Pronamide	0.76
Alachlor	0.38	EPTC	0.25	Propachlor	0.50
Atrazine	0.13	Hexazinone	0.76	Propazine	0.13
Bromacil	2.50	Imazalil	5.00	Simazine	0.30
Butachlor	0.38	Metolachlor	0.75	Tebuthiuron	1.30
Butylate	0.15	Metribuzin	0.15	Terbacil	2.20
Carboxin	0.60	Prometon	0.30	Terbutryn	0.25
Cyanazine	0.40	Prometryn	0.19	Triallate	0.50

Abbreviated Method Name: NPS Method 4 MRM for water
Method Reference: EPA National Pesticide Survey Method 4: Determination of Pesticides in Ground Water by High Performance Liquid Chromatography with an Ultra Violet Detector.
Method Detection Limit is listed as ppb (μg/L).

Cyanazine Diuron	0.58 0.070	Pronamide metabolite	0.81	Propham	0.75

Abbreviated Method Name: Paraquat and/or Diquat for water
Method Reference: Liquid Chromatographic Determination of Paraquat and Diquat in Crops Using a Silica Column with Aqueous Ionic Mobile Phase. J. Assoc. Off. Anal. Chem., 74, 961.
Method Detection Limit is listed as ppb (μg/L).

Diquat	0.50	Paraquat	0.50		

Abbreviated Method Name: Phenoxy MRM for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, Method Number 515.2: Determination of Chlorinated Acids in Water Using Liquid-Solid Extraction and Gas Chromatography with an electron Capture Detector, Revision No. 1.0.
Method Detection Limit is listed as ppb (μg/L).

2,4-D	0.28	Clopyralid	1.00	MCPP	2.60
2,4-DB	0.72	Dicamba	0.28	Pentachlorophenol	0.16
2,4-DP	0.30	Dichlofop methyl	0.60	Picloram	0.35
2,4,5-T	0.20	Dinoseb	0.28	Silvex	0.16
5-Hydroxy dicamba	0.25	MCPA	2.60	Triclopyr	0.25

Abbreviated Method Name: Phosphorus MRM for water
Method Reference: EPA Methods for the Determination of Organic Compounds in Drinking Water, Method Number 507: Determination of Nitrogen- and Phosphorus-Containing Pesticides in Ground Water by Gas Chromatography With a Nitrogen-Phosphorus Detector, Revision No.2.
Method Detection Limit is listed as ppb (μg/L).

Azinphos Methyl	1.30	Ethion	0.30	Metalaxyl	3.50
Chlorfenvinphos	0.70	Ethoprop	0.19	Methidathion	0.60
Chlorpyrifos	0.18	Ethyl Parathion	0.50	Methyl Parathion	0.50
Demeton-S	0.25	Famphur	0.60	Mevinphos	5.00
Diazinon	0.25	Fenamiphos	1.00	Oxydemeton Methyl	1.40
Dichlorvos	2.50	Fensulfothion	1.50	Phosmet	1.00
Disulfoton	0.30	Fenthion	0.20	Sulprofos	0.30
Disulfoton Sulfone	0.50	Malathion	0.40	Terbufos	0.50
Disulfoton Sulfoxide	0.38				

Abbreviated Method Name: PU MRM for water
Method Reference: EPA Method 533 Determination of Benzidines and Nitrogen-Containing Pesticides in Water by LLE and RP HPLC/Particle Beam/MS with in-house modifications. Instrumentation: "Multiresidue Method for Determining Substituted Urea Herbicides in Foods by Liquid Chromatography," Journal of the Association of Analytical Chemistry, 80, 740 (1987).
Method Detection Limit is listed as ppb (μg/L).

Diuron	0.50	Neburon	0.50	Siduron	1.00
Linuron	1.50				

Abbreviated Method Name: Sulfonylurea Herbicides MRM for water
Method Reference: Multiresidue Method for the Determination of Sulfonylurea Herbicides in Water by High Pressure Liquid Chromatography.
Method Detection Limit is listed as ppb (μg/L).

Bensulfuron methyl	0.10	Halosulfuron methyl	0.10	Thifensulfuron methyl	0.10
Chlorimurin ethyl	0.10	Metsulfuron methyl	0.10	Triasulfuron	0.10
Chlorsulfuron	0.10	Primisulfuron methyl	0.10	Triflusulfuron	0.10
Ethametsulfuron	0.10	Sulfometuron methyl	0.10	Nicosulfuron	0.10

Abbreviated Method Name: Triasulfuron for water
Method Reference: Ciba-Geigy Corp. Analytical Method for the Semi-quantitative Determination of Triasulfuron in Soil and Water by Enzyme Immunoassay including Validation Data.
Method Detection Limit is listed as ppb (μg/L).

Triasulfuron	0.05

Abbreviated Method Name: Tribenuron Methyl for water Method Reference: DuPont DeNemours Inc.'s Ultratrace Level Method for the Determination of Express from Water Samples Using Liquid Chromatography with UV Detection. Method Detection Limit is listed as ppb (μg/L).		
Tribenuron Methyl	0.050	

Sampling Procedures

Sampling activities may be performed by the MDA or pursued cooperatively with other agencies under a PSMP. All ground water sampling for pesticides will follow an approved QA/QC plan.

All PSMP sample procedures performed by the MDA will follow strict protocol. MDA has ground water monitoring and sampling standard operating procedures (SOPs). For sampling of materials other than ground water, the Quality Assurance Project Plan (QAPP) and the SOPs (both EPA regionally approved) for field activities will be referenced. Other agencies follow their own prescribed protocol not described herein. However, all ground water sampling conducted under a PSMP will conform to approved quality assurance and quality control (QA/QC) field and laboratory procedures. Such samples, as defined under ARM 4.11.101 (Definitions)(8), are considered official samples. All samples which do not meet approved protocols will be considered unofficial samples (ARM 4.11.101 (Definitions)(13)). Unofficial samples may only be used to initiate monitoring in a particular area and to notify local and state agricultural, environmental and health officials.

Monitoring Results

The MDA and DEQ will review and evaluate all official ground water test results. Responses to sampling and monitoring results is discussed in component 8: Response To Detections.

References

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Prevention and Management Measures

The philosophy of ground water protection in Montana focuses, first, on prevention and then on minimization and mitigation of pesticide ground water contamination. Regardless of whether pesticides are found to be present in ground water, prevention has been and will be the foundation upon which ground water protection programs and efforts are based. PSMPs will emphasize prevention and management measures that reduce the risk of ground water contamination.

Because preventive and response ground water program elements are closely interrelated, they will be employed together under a PSMP to provide effective management of pesticides and thus protection of ground water resources. Because of this, there may be some duplication of measures listed here and in Component 8, Response. A tiered approach has been developed which employs four levels of management described below under Prevention Matrix. Each level represents a group of options reflective of a specific intensity of management. Each successive level is increasingly more stringent. PSMPs will employ a particular measure or measures the State believes best matches Montana's strategy for protecting ground water and regulating pesticides. The state may choose to differentially apply prevention and response measures within a PSMP area. Selection of appropriate preventive elements and measures will be determined by the Department and the members of the Voluntary Advisory Committee. Measures may range from educational efforts and application of non-regulatory BMPs, to strict regulatory limitations or prohibition on the use of a pesticide.

In addition to state actions, registrants may voluntarily take steps to manage a pesticide. Voluntary actions may include:

1. A product stewardship program, such as the NOVARTIS educational program concerning AMBER herbicide;
2. Changes in formulation or pesticide label; or
3. Voluntary restrictions in marketing.

A PSMP will accommodate any environmentally sound voluntary actions made by a registrant.

PSMP measures can also be combined with other state activities, outside the scope of a PSMP, to enhance protection of ground water. For example, efforts are being made to combine well head protection activities, source water protection efforts and activities associated with the MBMG Ground Water Assessment program (vulnerability) with PSMP development. In areas where water

quality districts are established, PSMP can augment ground water protection measures. The agency or group with administrative responsibility for implementation of the element or measure will assume the lead in developing or tailoring that element or measure for use under the PSMP. Measures that are intended to be enforceable will be adopted as rules under the Administrative Procedures Act.

PSMP Prevention Level A

For: Basic prevention measures, no detections

Measures & Activities: One or more of the following may be implemented

Assessment of Use Areas
- Vulnerable/sensitive areas identified
- Drinking water sources identified
- Designation of restricted-use areas
  - non-use areas
- Differential protection which may include immediate use of level B or C measures even in the absence of detections for some vulnerable and/or sensitive areas identified as needing additional protection measures. Determinations will be based on information gathered and evaluated during assessment and planning.

Plan Compliance Assistance and Inspection Activities implemented

Education/Training
- Introduction of or review of PSMP concept
- Plan introduction
  - components of plan
  - record keeping requirements
  - responsibilities of applicators
- Coordination of Private and Commercial Applicator Training (PAT & CAT) between MSU ES and MDA
- Introduction of site specific voluntary risk reduction measures to protect ground water
  - BMPs, IPM, ICPM, IWM, FARM*A*SYST

Pesticide Use
- Follow all label directions

Other Measures Deemed Appropriate

Evaluation: Monitoring

Response: Any verified detection at or above a Method Detection Level will:
① Be investigated to determine cause and extent of contamination and potential risk from exposure. May result in corrective actions either voluntary or within the regulatory framework
② Prompt an evaluation of protection measures which may result in a change in prevention strategies or change in level of response from level A to B
③ Prompt an evaluation of the sampling strategy for that area which may result in changes to the sampling strategy; i.e., number of wells sampled, timing and frequency of sampling.

For:
- Extremely vulnerable/sensitive areas as identified in assessment and planning in the absence of detections and when determined to be the most appropriate means of addressing protection measures
- Areas having verified nonpoint source detections of a PSMP pesticide, the levels of which are < 50% of the standard, have not migrated from the point of origin, have not increased in concentration and do not represent a health risk due to consumption nor an environmental risk in a limited number of wells being sampled

Measures & Activities: All appropriate level A strategies may apply. In addition, one or more of the following may be implemented

Education/Training
- Montana PSMP area characteristics: soils, hydrology, aquifers, etc.
- PSMP and alternative pesticide characteristics
- Record keeping requirements increased
- Wellhead protection recommended
  - Wellhead protection concept, water quality districts, sole source aquifers, outstanding water resource program and protection measures introduced
  - Public Water Supply (PWS) and individual wellhead protection plans recommended
- Weed and insect identification, biological cycles, IPM, pesticide control options

Plan compliance assistance and inspection activities implemented

Risk Reduction Measures
- Site specific BMP and IPM approach required

Pesticide Use for vulnerable/sensitive areas, the following pesticide restrictions may be required:
- Rate, timing and frequency of application
- Pesticide formulation limitations
- Use of closed transfer systems, antiback siphon devices and check valves required
- Geographical use designations
- Irrigation type and timing with regard to pesticide application
- Soil and/or ground/surface water restrictions
- Others as identified and deemed appropriate

Public Water Supplies
- Public notification if PWSs are affected by contamination of a PSMP pesticide at a level which represents a risk or concern to the consuming public
- Additional requirements or recommendations pending assessments by DEQ

Individual Plan Development recommended for identified vulnerable/sensitive areas

Other Measures Deemed Appropriate

Evaluation: Monitoring and, potentially, sales and use data for source reduction activities, i.e., rate & frequency

Response: Any verified detection will:
① Be investigated to determine cause and extent of contamination and potential risk from exposure. May result in corrective actions either voluntary or within the regulatory framework.
② Prompt an evaluation of protection measures which may result in a change in prevention strategies or change in level or response from level B to C
③ Prompt an evaluation of the sampling strategy for that area which may result in changes to the sampling strategy; i.e. number of wells sampled and timing and frequency of sampling.

For: Areas where pesticide concentration is ≥ 50% but < 100% of the standard, concentration is increasing, migration of pesticide is occurring. Levels do not represent a health risk.

Measures & Activities: All appropriate level A and B strategies may apply. In addition, one or more of the following may be implemented:

Education/Training
- Operators are required to attend education/training. Content of training may be same as licensed and permitted applicators or may consist of a more basic approach. Approach will be dependent upon the risk to the environment and number of operators

Compliance Assistance and Inspection Activities implemented

Pesticide Classification
- Products may be classified as restricted use by the state if not already classified in Level A or B or by EPA

Pesticide Use
- Reduced use areas designated
- Restricted use areas designated
- Use permitting may be required

Alternative water/treatment recommended or required

Individual Plans Required
- Identification and assessment of mixing/loading, storage and distribution areas
- Identification, location, risk assessment of well, abandoned wells and other structure or conditions which represent an open conduit to ground water and well head protection strategies
- Mapping of use areas with problem areas identified in relationship to mixing/loading, storage sites, water features, soils, wells, etc.
- Application information: formulation, rate, timing, frequency, equipment
- Environmental characterization: soil types/texture, organic matter, depth of soils, leaching potential assessment
- Emergency response outline/plan for spills and accidents

Evaluation: Monitoring, compliance inspections

Response: Any verified detection will:
① Be investigated to determine cause and extent of contamination and potential risk from exposure. May result in corrective actions either voluntary or within the regulatory framework
② Prompt an evaluation of protection measures which may result in a change in prevention strategies or change in level of response from level C to D
③ Prompt an evaluation of the sampling strategy for that area which may result in changes to the sampling strategy, i.e., number of wells sampled and timing and frequency of sampling.

PSMP Prevention Level D

For:	Areas with verified pesticide detections at ≥ 50% of the standard which also represents a significant health risk, or where levels are increasing and/or migrating and previous levels are not felt to be adequately protecting the resource or in emergency situations
Measures & Activities:	All appropriate level A, B and C strategies may apply. In addition, one or more of the following may be implemented
	Pesticide Use • No use areas designated Alternative water sources or treatment required
Evaluation:	Monitoring, compliance inspections
Response:	Any verified detection will: ① Be investigated to determine cause and extent of contamination and potential risk from exposure. May result in corrective actions either voluntary or within the regulatory framework ② Prompt an evaluation of protection measures which may result in a change in prevention strategies ③ Prompt an evaluation of the sampling strategy for that area which may result in changes to the sampling strategy; i.e., number of wells and timing and frequency of sampling ④ Prompt state to consider cancellation of product

Plan Evaluation

The management strategy and preventative measures for a pesticide will, primarily, be evaluated using ground water monitoring results and comparing them to response mechanisms. Management plan monitoring response mechanisms are specified in the Montana Agricultural Chemical Ground Water Protection Act, 80-15-212 (1), MCA. Use of sales and applicator use records also may be used to evaluate the effectiveness of prevention measures (i.e., to determine if a reduction in usage has occurred or to assure appropriate pesticide usage).

Assessment and evaluation type monitoring for the pesticide must increase when verified detections at the specified trigger levels occur. This increased monitoring will be a factor in determining whether and to what degree to further revise management measures. Revision may include instituting additional, different and/or more stringent measures. The number and frequency of detections will be a factor in the review and revision of PSMP preventive measures. A PSMP will have to strike a balance between the amount and integrity of the data and the need to respond to assessment and evaluative monitoring. For example, detections above trigger levels in a single well or at a low frequency rate can be the basis for implementation of prevention and management action if the data are considered reliable and representative of the managed use of the pesticide. Conversely, multiple detections may not trigger action if reasonable doubt exists as to quality assurance or that the data does not represent conditions under which the pesticide is currently managed. Following this, if monitoring demonstrates continued detections in excess of acceptable

PSMP levels, then progressively more stringent prevention and management measures will be implemented.

Preventive Measurement Rationale and Descriptions

Discussion of preventive measures has been limited to preventive measures specified in the prevention matrix.

Education and Training

Rationale: If ground water resources are to be provided protection from contamination, efforts have to be approached from a top-down and bottom-up perspective. The top-down approach involves the enactment of regulations and laws, development and implementation of strategies and programs which carry out the intent of the regulations and laws and enforcement of both the regulations and laws and the strategies and programs. The bottom-up perspective approach is based on individuals willing to carry out specific tasks to achieve a desired end result. More often than not, the bottom-up approach embraces an idea on merit rather than a set of regulated mandates. Both approaches have to compliment one another. Rules, regulations and laws as well as strategies and programs are dependent upon the collective concerns of the public. If the public doesn't embrace the ideal or intent of laws or programs, implementation is almost certain to fail as well.

Management plans must be reflective of this twin approach. The programs and regulations must be "do-able" from the farmer, producer, grower and applicator's perspective because, ultimately, it's their acceptance and implementation that produces the desired end result. In addition, the results have to justify the applicator's efforts - was the additional cost of time, effort and money to use the pesticide in the prescribed manner acceptable (worth it) in terms of the cost/profit ratio and perceived protection afforded the ground water resources. Education and training provide the necessary information for the applicator to make informed and sound decisions with regard to application of management plan regulated pesticides.

Evaluation Mechanisms: Education and training will be evaluated through monitoring results (positive detections not associated with environmental considerations), use records, violation types and numbers (violations that are occurring on a regular basis which seem to stem from lack of understanding of requirements not appropriately covered through training and education efforts) and applicator feedback. Education and training can then be refined to bridge the gaps between education and compliance . Refinement could include delivery type and technique, providing additional educational opportunities and coverage of problem specific topics.

Descriptions

Initial Training Pesticide users are required to acquire and maintain a basic level of understanding of pesticides, their properties, their proper use, and the risks their use may pose to the environment. Initial training provides individuals with a well rounded introduction to pesticide related topics. Discussions combine pesticide knowledge with assessments of the application environment. The combination provides the user with the necessary information and tools to make sound decisions in

the field. Initial training also provides an introduction to management plans and a discussion of the use requirements and/or restrictions of pesticides currently regulated under management plans.

Recertification Training Recertification training provides more specific information to dealers, commercial, government and private applicators related to the applicator category within which they perform most of their work. Topics include periodic review of ground water and pesticides basics as well as specific information on how to avoid point source contamination, how to use pesticides in ways that will minimize the chances of ground water contamination, environmental characteristics and environmental assessment tools and techniques, characteristics of agricultural chemicals and their leaching potentials, state monitoring programs and results and management plans. Part of the training focuses on providing applicators with hands-on experience with evaluative tools, such as the Relative Aquifer Vulnerability Evaluation (RAVE). RAVE is an aquifer vulnerability scoring system developed to assist farmers and pesticide applicators reduce the potential for contaminating ground water with pesticides. This numeric scoring system helps individuals pair evaluation of pesticide selection with the specific site impairment potential. Recertification training will address management plans, in general, to create an awareness of such plans. In addition, training will cover specific plan details (including restrictions and requirements) when such plans are expected to directly impact pesticide application and usage of the applicator category for which the training is geared.

Operator Training Operator training will either follow the format for initial training or for recertification training dependent upon the level of knowledge, awareness and plan requirements determined to be appropriate.

Presentations to the General Public And/or Interested Groups Presentations to interested groups will provide a basic introduction to the concept of management plans (laws and regulations, purpose, intent of), components of the management plan, specific discussion of the management plan pesticide of interest, and requirements of such plans. Presentation content and style will be appropriate to the audience.

Communication and Outreach

Rationale: Communication and outreach efforts create an awareness about management plans. Communication and outreach efforts will be directed to the public, in general, and to the regulated community. Specific management plan information, requirements, restrictions and updates can also be disseminated to the general public and regulated community through communication and outreach measures. Managers of public water supplies affected by contamination of a PSMP pesticide may also need to communicate risks to the consuming public.

Evaluation: Monitoring results, compliance issues and feedback via mail and phone will be used to evaluate effectiveness of communication and outreach efforts.

Description: The use of pesticide newsletters, directed mass mailings, radio announcements, newspaper articles and public meetings will be used to accomplish communication and outreach

goals. Notification of the consuming public when a Public Water Supply (PWS) is impacted will be accomplished as deemed appropriate by the DEQ. DEQ usually works with the affected PWS and other agency cooperators in developing notices. Timing and content of such notices will be determined and approved by DEQ.

Risk Reduction Measures

Rationale: Pesticide risks may be reduced when pesticides are applied properly and prescriptively.

Evaluation: Evaluation of risk reduction measures will be accomplished through applicator surveys, evaluation of sale and use records and monitoring results.

Descriptions:

Integrated Pest Management (IPM), Integrated Weed Management (IWM) and Integrated Crop Pest Management (ICPM) Programs Effective pest management strategies integrate biological, cultural and chemical control mechanisms. Integrated pest management uses a systems approach to prevent and reduce pest damage to tolerable levels through an integrated process using natural predators and parasites, genetically resistant hosts, environmental modifications, and, when necessary and appropriate, pesticides. IMP, IWM and ICPM promote judicious and proper use of pesticides and maximize the effectiveness of applied pesticides. The purpose of these systems is to evaluate the costs, risks and benefits of a particular control strategy. An IPM, IWM or ICPM program, when added to crop management strategies, maximizes fertilizer and water use efficiency providing an additional measure of ground and surface water protection.

The Certified Crop Adviser (CCA) Program The CCA program is a cooperative effort between MDA, DEQ, NRCS, independent consultants, Montana Agriculture Business Association (MABA) and MSU ES to ensure that individuals advising growers are qualified to make recommendations for the use of agricultural chemicals and nutrients that are economically and environmentally sound. CCA certification is conferred on individuals who have met a minimum set of standards through examination and who maintain their CCA accreditation through continuing education.

Best Management Practices (BMPs) BMPs are methods or practices used to control or reduce point and nonpoint source pollution. BMPs provide a framework for integrated nutrient and pesticide management. The proper combination of BMPs in agricultural production systems provide protection of both ground and surface water at a site specific level.

The Farmstead Assessment System (Farm*A*Syst) The Farm*A*Syst program was developed as a cooperative effort among a large number of Midwestern agencies to educate farmers and rural residents in the use of systematic techniques to voluntarily assess water resource impairment risks at their farmsteads. It is a proven, effective method of helping users increase their ability to recognize water pollution risks. It encourages and facilitates the use of appropriate actions to reduce and prevent pollution and to correct problems identified by this program. The MSU ES Water Quality

program has revised the Farm*A*Syst program developed by the USDA Extension Service, NRCS and the EPA, so that it is suitable for use in Montana.

Source Water Protection Program The Montana Source Water Protection Program is administered by the DEQ and is designed to provide protection to public water supply wellhead areas by identifying and managing sources of contamination. Help is available to local communities interested in protecting wellhead areas and aquifer recharge areas.

Pesticides Risk of leaching can be reduced by carefully selecting pesticides that have low solubilities, high sorption potentials and that exhibit short environmental persistence. Risks can also be reduced when pesticides are applied only when needed, in the lowest amount that will achieve the desired control and only when other effective alternative control methods are not available.

Compliance & Technical Assistance

Rationale: Compliance assistance provides an opportunity for individuals to receive assistance from regulators in understanding and implementing requirements of management plans and a variety of other compliance issues. Compliance assistance can help reduce violations of plan requirements by providing a better understanding of the requirements and specific actions and activities required of the individual under such plans. Technical assistance is available to the pesticide user through the MBMG, USGS, NRCS, DNRC, Montana State University (MSU), DEQ, MDA, Public Health, Conservation Districts, Extension Agents, Farm Services Agency (FSA) and others. Pesticide compliance and technical assistance is available through MDA. Technical and compliance assistance can provide data, information, answers to questions, assistance in understanding data and information and in planning. Assistance may cover topics such as pesticides, ground water, soils, geology, hydrogeology, agronomy, pests and pest cycles, wellhead protection, and water quality and quantity issues.

Evaluation: Number and type of violations and follow-up inspections and investigations will be used to evaluate effectiveness of compliance and technical assistance as a preventive measure.

Description: Compliance assistance will be used to disseminate information about management plans and to assist the regulated community in meeting requirements of management plans.

Pesticide Classification

Rationale: Pesticides which pose an unreasonable risk to ground water resources may require intensive management and an adequate tracking mechanism. Classification of management plan pesticides from a general use to a restricted use would provide a mechanism to track sales and use through record keeping requirements.

Evaluation: Record keeping, licensing requirements, inspections and monitoring will be used to evaluate effectiveness of measure.

Description: When the state has determined that a management plan pesticide represents an unreasonable risk to ground water resources and other preventive measures have not or are not expected to provide the degree of protection desired, the state may consider classifying a general use pesticide as restricted use.

Pesticide Usage

Rationale: In areas where pesticide applications are not made, impacts from pesticides to the environment should not occur. Where applications are made according to the label and/or current level of restrictions and still fail to prevent unreasonable risks, it is appropriate to consider implementation of additional restrictions. Such restrictions or requirements should reduce the amount, toxicity and persistence of pesticides introduced into the environment and reduce the potential for pesticide leaching.

Evaluation: Use records, inspections, investigations, and monitoring results will be used to evaluate pesticide usage issues.

Descriptions:

No Use Areas No use areas will be defined as those areas where the pesticide of concern is not used or where no use is recommended or allowed because of vulnerability/sensitivity.

Restricted Use Areas Restricted use areas will be delineated based on designated vulnerable or sensitive areas where additional preventive measures are necessary to protect ground water resources but where a "No Use" designation is not necessary and for areas having verified positive detections that have not responded to other implemented preventive measures. Pesticide usage may be subject to the following limitations and/or restrictions:

- rate of application,
- total amount of pesticide applied,
- timing of application with respect to season, irrigation and precipitation events,
- application equipment,
- application type or method (aerial versus ground application; foliar versus ground surface versus incorporation, broadcast, row, spot, etc.),
- number of application per growing season or year,
- proper calibration,
- required use of closed transfer systems, antiback-siphon devices and check valves,
- soils,
- irrigation type and timing,
- hydrogeological conditions,

Reduced Use Areas Application rate and amounts may be specified for a particular geographical area if the area is identified as vulnerable/sensitive or if positive detections, as a result of monitoring efforts are verified, to reduce total inputs of pesticides to the environment.

Setback areas Setback or buffer areas may be designated around wells, surface water features hydrogeologically connected to ground water, recharge areas and identified vulnerable or sensitive areas.

Permitting and Individual Plan Development

Rationale: When and where other prevention measures have not provided the level of protection desired or needed, permitting and individual plan development may be considered. Permitting and individual plan development will allow greater control and monitoring of pesticide usage. Record keeping combined with permitting or individual plan development will allow more precise tracking of pesticide use and timing of sampling and monitoring activities. This should allow investigators to more precisely pin-point sources of contamination.

Evaluation: Use records, monitoring, inspections and investigations will be the evaluative tools used.

Descriptions:

Permitting For designated areas, applicators will be required to obtain a permit prior to making any application of certain pesticides. Permits would require the following information: name of applicator, name of landowner if different than applicator, mailing address, phone number, pesticide license or farm permit number, application location, name and formulation of pesticide, method of application, date of application and any other information deemed appropriate.

Individual Plan Development For designated areas, applicators and/or landowners would be required to submit, for approval prior to any application of management plan pesticides and/or other identified pesticides, an individual management plan. Individual plans would consist of a map of the geographical area showing location of structures, mixing and loading areas, pesticide storage areas, cropping areas, bodies of water, roads, legal description, soils, organic matter, ground water distribution and depth and location of wells. The plan would also require:

- a discussion of the pertinent environmental characteristics (soils, geology, ground water) found in the plan area,
- identification of vulnerable and/or sensitive areas based on soils with moderate to high leaching potential overlain with ground water location and depth and other variables as deemed appropriate (i.e., irrigation),
- details of pesticide application (formulation, rate, timing, frequency, equipment, etc.) to the area including mitigation measures for areas identified as moderate to high risk because environmental conditions, pesticide characteristics and application considerations,
- identification and assessment of mixing/loading, storage and distribution areas,
- Identification, location and risk assessment of wells, abandoned wells and other structures or conditions which represent an open conduit to ground water and well head protection strategies,
- mitigation measures and
- emergency response plan.

Monitoring

Rationale: Monitoring by users and registrants will augment the monitoring conducted under a management plan.

Evaluation: Monitoring data generated from sampling will be used to evaluate the effectiveness and/or usefulness of the activity.

Description: Where risk assessment indicates a need for additional monitoring, use may be paired with monitoring requirements. Monitoring closely correlated with usage would increase awareness of the link between pesticide usage, pesticide fate and impairment of the environment by pesticide applicators and users. Monitoring by registrants provides a means to accomplish the goals of a management plan in a manner which also promotes partnerships in managing pesticides for the protection of ground water resources.

Alternative Water Supplies

Rationale: Protection of human health will be addressed through discontinued consumption of impaired water resource.

Evaluation: Review of sampling results and assessment of the need for an alternative water supply. When the well owner is responsible for providing an alternative water supply for his/her own use, as recommended, the discretion of the well owner will be used. Mandatory provision of an alternative water supply by a responsible party or registrant will be accomplished through agreement, regulation and/ or compliance order, as may be appropriate.

Description: When impairment of public water supplies are involved, the use of an alternative water supply or treatment of water supplies until such time as monitoring results indicates risk of consumption have been adequately addressed may be recommended or required. When impairment of domestic and other private use wells occur at a level which is representative of a health risk, the well owner will be apprised of such conditions, provided with the health based standard for the pesticide in question, and provided with a recommendation for the use of an alternative water supply. An alternative water supply or treatment of the water supply for the private well owner may be provided by the registrant or responsible party if such an agreement is reached between the Department, the registrant and the well owner.

Responses to Detections of Pesticides

Whenever a pesticide detection in ground water occurs, well owners will be notified and when necessary, additional sampling scheduled. Well owners will be notified of detections of pesticides in writing unless concentrations meet or exceed 50% of the standard, in which case, notification will be made verbally, within 24 hrs, followed by written notification. All notifications will indicate the purpose of monitoring and findings of sampling. Findings will include identification of pesticide(s) found, the concentration of the pesticide(s); standard(s) for the pesticide(s) in ground water; recommendations concerning suitability of water for designated uses, i.e., domestic water supply, livestock consumption and irrigation; source(s) of contaminant(s) if known; and recommendations that would prevent, minimize or mitigate further contamination. In cases where consumptive uses of the water are not recommended, the owner will be advised and installation of an appropriate treatment system or use an alternative water source will be recommended. Confirmed pesticide detections in ground water will be reported to the DEQ.

Verification Sampling

All monitoring resulting in an initial, unconfirmed detection of a pesticide in ground water at or exceeding the analytical method detection limit (MDL) will be resampled within 30 days. However, If ground water from the well serves as a drinking water source, the well owner will be notified of the detection and resampling of the well will be scheduled within 10 working days. If the concentration of the pesticide is 50% of the maximum contaminant level (MCL), health advisory (HA) or interim standard (IS) or greater, the well owner will be notified of the detection and resampling will be scheduled within 3 days.

Expanded Sampling

Expanded sampling will be scheduled to determine the extent of impairment upon verification of a pesticide in ground water. Expanded sampling will include at least one upgradient and one downgradient well of similar depth and screened well interval, whenever possible, which perforates the aquifer of concern. Ideally, wells will be within one mile of the originally sampled well. Additional expanded sampling will be conducted as needed to fully determine the extent of impairment and number of wells impacted by the impairment. Follow-up sampling will be conducted to monitor the concentration of the pesticide in ground water and evaluate effectiveness of changes in management. Follow-up sampling will continue until ground water samples show no pesticide detections at or above the MDL over a two year time period.

Investigation

At the same time, an investigation will be initiated to determine the cause(s) of the impairment. Response to detections will be dependent upon the identified cause of impairment, the value and use of the ground water, vulnerability of the ground water and the concentration of pesticide(s).

Monitoring Results From Other Agencies

Positive detections for pesticides resulting from other agency monitoring and sampling activities are referred to DEQ and/or MDA. MDA and DEQ have a Memorandum of Understanding (MOU) outlining how sampling and monitoring data will be shared and time frames for reporting of verified positive detections. MDA and DEQ jointly review all positive detections for pesticides to determine appropriate responses.

Response When Verified Pesticide Detections In Ground Water Are Less Than The Standard

Substantial differences in response may occur depending on whether a detection is determined to be point or nonpoint source in nature, see chart 8.1. In developing a response to pesticide detections, especially as it relates to use requirements contained in a PSMP or pesticide label, care must be taken to determine whether a detection resulted from use in accordance with those requirements. An investigation in response to a positive detection of pesticides in ground water will include a determination of whether misuse occurred and, if so, whether the misuse contributed to or caused the impairment. In some cases, the level of investigation necessary to make a clear determination of the cause of impairment for each detection of agricultural chemicals in ground water may be difficult or, in some cases, impossible to obtain. In such cases, the state's response will be based on best available information and professional judgement and with public health protection in mind. When it is determined that an emergency exists, response actions may be implemented before completion of an investigation.

The definition of the term "misuse" includes any use of a pesticide that is inconsistent with label directions. Use directions that are part of a PSMP essentially will become part of a pesticide label since the label will direct the user to comply with the PSMP. Failure to comply with a PSMP will, therefore, constitute misuse or use inconsistent with the label. If the evidence gathered during an investigation proves that misuse occurred, Montana will initiate appropriate enforcement actions. These actions will be consistent with the authority allowed under the FIFRA, SDWA, CWA, MPA and MACGWPA. For more information on enforcement actions, refer to component 9. When contamination is shown to occur due to misuse, the State will respond through appropriate enforcement against the responsible party.

Detections resulting from nonpoint sources will be evaluated to determine an appropriate management measure or measures which prevent, minimize or mitigate the pesticide's presence in ground water. In most cases the response will be to implement one or more preventive measures discussed in Component 7. In addition, pesticide detections at or exceeding trigger levels (see

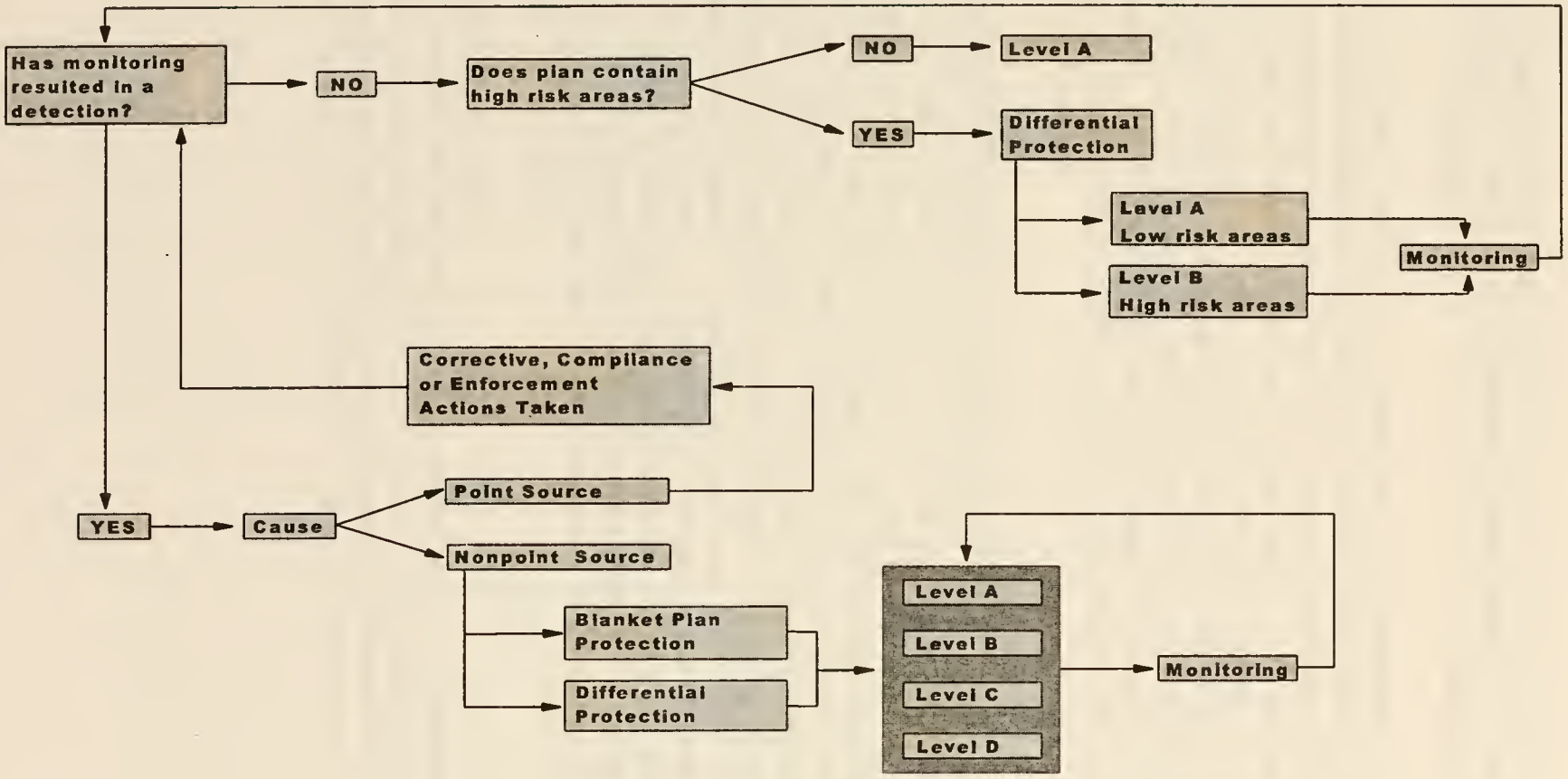

Chart 8.1 Monitoring Response Flow Chart. Level A, B, C and D refer to the preventive management measures described in component 7.

prevention matrix for associated trigger levels) will be used to evaluate the effectiveness of the management plan for that pesticide, to determine whether additional prevention steps are required under the PSMP management level or if a more intense level of management is necessary.

Response When Pesticide Detections Are In Exceedence Of Standards

Detections in excess of a MCL or HA in a drinking water well, that occur through proper use, will be considered to be indication of failure of all or part of the current management strategy for that pesticide. Label modifications may be used to further restrict and manage pesticide inputs. In cases where repeated attempts to manage a pesticide have failed, response will include severe use restrictions or ultimately, prohibition of use. Alternative water or installation and use of water treatment may be recommended. Identified responsible parties (point sources) or registrants (non-point sources) may be required to install water treatment systems or supply alternative water supplies to affected users, to conduct additional monitoring and may be required to clean up contaminated resources.

Monitoring Response To Detections In Public Water Supplies

Public Water Supplies are regulated through the DEQ. All verified positive detections of ground water which serves a public water supply are reported to DEQ. Responses are dependent upon legitimate verified detections of pesticides in ground water supplies. Legitimate detections are those which have a concentration greater than the Method Detection Limit (MDL). Once a pesticide detection has been verified, quarterly sampling is required until results indicate that the pesticide concentration is reliably and consistently below the MCL. Quarterly sampling may then be reduced to yearly sampling, with sampling occurring in the quarter with the recorded highest concentration. Responses currently apply to pesticides regulated under Safe Drinking Water Act (SDWA). Approved treatment (blending or installation of treatment system) or development of a new water source is required if monitoring indicates the continued presence of a pesticide or pesticides in exceedence of the standard. Public notices are required when SDWA regulated pesticide detections exceed the MCL. Monitoring, sampling and responses by DEQ comply with SDWA requirements for Public Water Supplies.

Remedial Responses

A PSMP, while emphasizing prevention, may also include provisions to treat or contain contamination in ground water or soil. Remedial responses will depend on a number of factors, including the type of well in which the detection occurs, the concentration of the pesticide, whether the product detected has been previously detected in ground water, and the threat to public health.

Enforcement

Authority

The State has authority through the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA), the Montana Pesticide Act (MPA) and the Montana Agricultural Chemical Ground Water Protection Act (MACGWPA) to enforce implemented Pesticide Specific Management Plans (PSMPs). The Montana Department of Agriculture (MDA) has primacy for enforcement of FIFRA and MPA. Whenever possible, enforcement actions are pursued under enforcement authority of the Montana Pesticides Act. Noncompliance in areas that are solely covered by FIFRA, is referred to the EPA for enforcement action. MACGWPA is administered jointly by MDA and the Department of Environmental Quality. While the MACGWPA clearly defines the responsibilities of each department, the law makers of Montana intended for the Departments to coordinate their rule-making efforts and adopt identical rules for areas of joint responsibility whenever possible. Both departments are also responsible for coordinating enforcement activities under 80-15-403, MCA and for evaluating agricultural chemical monitoring results. The DEQ and the MDA coordinate response, cleanup, and enforcement activities concerning agricultural chemical releases through a reciprocal MOU. Coordination of enforcement activities under the MOU occurs through both verbal and written notification in the form of telephone contacts, meetings, and exchange or correspondence.

Pesticide related enforcement issues may also be pursued by the DEQ through the Montana Water Quality Act (Title 75, chapter 5, MCA), Nondegradation rules (ARM 17.30.701 et. seq.), Montana Ground Water Pollution Control System (ARM 17.30.1025), Public Water Supply Act (Title 75, Chapter 6, MCA), Montana Solid Waste Management Act (Title 75, Chapter 10, Part 2, MCA), Montana Hazardous Waste and Underground Storage Tank Act (Title 75, Chapter 10, Part 4, MCA) and the Montana Comprehensive Environmental Cleanup and Responsibility Act (Title 75, Chapter 10, Part 7, MCA). FIFRA, MPA and MACGWPA and other pertinent laws are discussed in detail in Component 3: Legal Authority.

Enforcement Strategies

PSMPs will be adopted through state rule making and therefore will be enforceable under the MACGWPA. PSMP Pesticides will have specific label directions requiring users to comply with the state's PSMP. Failure to comply with a PSMP will be a violation; use of a pesticide in a manner inconsistent with label directions. Both FIFRA and the MPA require that pesticides be used in a manner consistent with label requirements.

The MDA enforcement staff will be involved in the planning phase of all PSMPs and will take the lead in developing an appropriate enforcement strategy for plans. MDA enforcement staff will seek input from DEQ enforcement staff when developing PSMP enforcement strategies. Enforcement staff will also be involved in assessing existing preventative strategies relative to monitoring and other evaluative information and data, recommending changes in strategy and formulating compliance strategies specific to areas within the PSMP zones that are problematic. The objectives of PSMP enforcement will be to:

- ensure the regulated community is in compliance with the PSMP,
- have an educational component of the PSMP enforcement program (through one-on-one contact and compliance assistance),
- incorporate PSMP enforcement activities into the ongoing enforcement program.

Once applicators are aware of the PSMP and have attended PSMP training (initial, recertification and/or other required training), compliance will be achieved primarily through regulated community (applicator)-enforcement staff contact in the field. MDA representatives conduct routine inspections of pesticide applicators and dealers in accordance with the department's neutral and targeted inspection scheme. One of the purposes of routine inspections is to assure compliance and to offer assistance. PSMP compliance components will include plan awareness, plan requirements, records review, consideration of vulnerable areas and areas of concern with the PSMP geographical boundaries, monitoring results for that area and label compliance. Use inspections may also be conducted to ensure compliance with labeled pesticide directions, PSMP geographical plan restrictions and required individual plans or permits.

MDA representatives may also conduct for-cause inspections when there is reason to suspect noncompliance with FIFRA, MPA or MACGWPA. When routine, use or for-cause inspections indicate noncompliance with PSMP requirements, enforcement action can be taken. Likewise, when an investigation to determine the cause and source of a detection of a pesticide(s) in ground water (as evidenced through monitoring) indicate pesticide misuse, spill, accident or other label violation, enforcement or corrective action can be pursued.

Enforcement action may include verbal or written warnings; compliance agreements; compliance orders; civil, criminal or judicial action; suspension or revocation of license and/or certification; embargoing of pesticide product or other action deemed appropriate. When imposing penalties, the MDA is not required to assess the maximum penalty just because it is authorized to do so by the Act. If circumstances warrant, other enforcement actions such as verbal or written notices of violation may be issued. The level of enforcement action issued will be determined on a case-by-case basis. For example, the range of an enforcement response could include sending an informative letter, issuing a letter of warning, assessing a civil penalty or penalties, revoking an applicator's license and/or certification or issuing a compliance order. Enforcement actions will be in support of Component 6 (Monitoring), Component 7 (Prevention and Management Measures) and Component 8 (Responses to Detections of Pesticides) actions, findings and monitoring.

DEQ will assume the lead in enforcement activities when pesticide contamination of public water supplies occurs. When private ground water supplies are impacted, MDA will, generally, assume primary enforcement responsibility.

Enforcement of PSMPs

Specific agricultural chemical ground water management plans (PSMPS) must, by statute 80-15-214 (1), MCA, include:

- ❖ requirements to prevent ground water impairment that are based on ground water use, value, and vulnerability and that address all applicable aspects of agricultural chemical use and
- ❖ requirements to prevent or minimize further presence of the agricultural chemical in ground water and to provide protection for the present and future beneficial use of the ground water.

The Department will consider the incorporation of other appropriate elements in the PSMP that are necessary to achieve the requirements of 80-15-214(1), MCA and other requirements of Title 80, chapter 15, MCA. These may include:

- ❖ identification of geographical areas where an agricultural chemical may be used,
- ❖ ground water, soil, meteorological and geological characteristics,
- ❖ best management plans and best management practices;
- ❖ identification of high-priority ground water,
- ❖ certification, licensing, training, and education requirements for persons using agricultural chemicals,
- ❖ identification of setback areas around water wells where certain activities may be restricted,
- ❖ agricultural application rates and timing and related use criteria,
- ❖ alternative pest management techniques, including integrated pest management,
- ❖ other requirements for pesticides, as set forth in Title 80, chapter 8, and related rules, and for fertilizers, as set forth in Title 80, chapter 10, and related rules,
- ❖ EPA requirements,
- ❖ alternative soil fertility practices

Incorporation of these additional elements into the PSMP must, by statute (ARM 4.11.302), be contingent upon:

- ◆ the extent and nature of the problem,
- ◆ the type of agricultural chemical(s) involved,
- ◆ soil and water analytical results,
- ◆ geological and aquifer characteristics when known,
- ◆ land use patterns,
- ◆ soil type and related characteristics,

- meteorological conditions,
- depth to ground water,
- current and potential beneficial uses of the groundwater,
- physiography,
- jurisdictional and ownership boundaries and
- other elements deemed necessary by the department.

Enforcement of PSMPs will be based upon the required contents and all additional elements necessary to accomplish the PSMP objectives and overall goal - protection of ground water resources. Once PSMPs are developed and adopted as rule, implementation of the plan will occur followed by evaluation of the plan. Evaluation includes checking compliance through the measures previously described. Enforcement activities will be based on the specified contents of the PSMP. The following may be used to accomplish compliance with the PSMP:

Emergency Actions

The MDA can issue orders or adopt rules without going through a public hearing process in the event of emergencies. Such emergency actions are taken to prevent use of water that is impaired or likely to be impaired, or to act immediately to correct situations that could result in impairment of ground water. The MDA may seek court ordered injunctions to restrain persons from violating the Act or engaging in actions that cause agricultural chemicals to enter ground water in violation of a standard.

Compliance Orders

A compliance order can be issued and/or adopted as an Specific Management Plan (SMP) to any person who causes agricultural chemicals to be present in ground water at concentrations above an established standard. Compliance orders can require characterization of the environment, inventory environment resources, conduct monitoring, make changes in their operations and provide alternative water supplies. Compliance orders can be issued to require the cleanup of agricultural chemicals that have been purposely or accidentally spilled or misused where there is a significant probability that the chemical will enter ground water. A compliance order can also require that persons served with the order submit a written plan describing procedures for conducting corrective actions. Prior to issuing a compliance order, the MDA is required to consult with the DEQ, so that actions taken by the two agencies are coordinated and consistent.

Civil Penalties

Civil penalties may be assessed for violations. In general, violations occur if PSMP requirements or orders issued under the Act are not followed, or when any provision of the Act or rules are not followed. Civil penalties can be assessed administratively by the MDA, or judicially by filing complaints in district court. Administrative civil penalties can be up to $1000 for each offense with the exception that farm applicators applying fertilizers or with a pesticide permit cannot be assessed more than $500 for the first offense. Judicial civil penalties can be up to $10,000 for each occurrence of a violation. In deciding whether to issue a civil penalty the MDA must consider the gravity of violations, the significance of harm that resulted, and a person's history of compliance.

The MDA can also consider the effect of a civil penalty on a person's ability to stay in business. In order to consider financial impacts, the MDA must have bonafide financial documentation presented by the charged person.

Criminal Penalties

The MACGWPA also provides for criminal penalties for intentional violations. These penalties are imprisonment up to 1 year and a penalty of $25,000 for each day that a violation continues.

Criminal penalties are also authorized if persons misrepresent or try to prevent the MDA from performing authorized duties, for making false statements or records, or for revealing confidential information with intent to defraud. The MDA is also authorized to file civil complaints to seek injunctive relief against continuing violations.

Coordination of Enforcement Activities

PSMPs will detail the specific technical and administrative tasks to be performed by each participating state agency. The extent to which each agency or department will be involved will depend upon the specifics of each management plan and the necessary coordination of local, state and federal regulations including FIFRA, SDWA, Resource Conservation and Recovery Act (RCRA) and CERCLA with management plan requirements.

Cited References

Montana, state of. Administrative rules of Montana, title 16, chapter 20. State of Montana, Helena, MT.

Montana, state of. Montana agricultural chemical ground water protection act. MCA Title 80, chapter 15. State of Montana, Helena, MT.

Montana, state of. Montana comprehensive environmental cleanup and responsibility act. MCA Title 75, chapter 10, part 7. State of Montana, Helena, MT.

Montana, state of. Montana hazardous waste and underground storage tank act. MCA Title 75, chapter 10, part 4. State of Montana, Helena, MT.

Montana, state of. Public water supply act. MCA Title 75, chapter 6. State of Montana, Helena, MT.

Montana, state of. Montana solid waste management act. MCA Title 75, chapter 10, part 2. State of Montana, Helena, MT.

Montana, state of. Montana water quality act. MCA Title 75, chapter 5. State of Montana, Helena, MT.

Public Awareness and Participation

Public opportunity to provide input and comment on the methods chosen for ground water contamination prevention and the proposed regulatory framework are one of the EPA requirements for this plan. This component describes the provisions being made to involve the public in PSMP development, review and modification.

General Public Awareness and Participation Provisions

The Montana Agricultural Chemical Ground Water Protection Act (MACGWPA) (80-15-104(5), MCA) requires the administration of the Act, including hearings and rulemaking, to be conducted in accordance with the Montana Administrative Procedure Act (1.7.101, ARM). Montana Codes Annotated, 2-4-101 et seq., are printed for insertion under Chapter 7 of the Administrative Procedure Act as they appear in the Montana Codes Annotated. The following is a list of public awareness and participation codes and titles germane to decision making, development and implementation of PSMPs:

2-4-103, MCA.	Rules and Statements to be made available to the public.
2-4-302, MCA.	Notice, hearing, and submission of views.
2-4-303, MCA.	Emergency or temporary rules.
2-4-304, MCA.	Informal conferences and committees.
2-4-305, MCA.	Requisites for validity -- authority and statement of reasons.
2-4-306, MCA.	Filing, format and effective date -- dissemination of emergency rules.
2-4-307, MCA.	Omissions from ARM or register.
2-4-308, MCA.	Adjunctive or interpretive rule -- statement of implied authority and legal effort.
2-4-315, MCA.	Petition for adoption, amendment, or repeal of rules.

Additionally, public participation for the development and modification of PSMPs is specifically addressed in the MACGWPA Administrative Rules (ARM 4.11.203, 4.11.205, 4.11.304, and 4.11.306).

In accordance with these rules, for development and modification of the management plans (4.11.203, ARM), the MDA is required to:

1. Prepare an outline of the management plan for use at public meetings;
2. Sponsor interagency and public meetings;

3. Consult with local, state and federal agencies, universities, agricultural user groups and the public to identify the provisions; best management plans and practices; information and data needed; and plans for development of the PSMP.

Prior to development of the PSMP draft, public participation and comment must be solicited concerning the content and development of the management plan. Upon completion of these activities, the MDA is required to prepare a draft management plan. MDA must solicit, through meetings and correspondence, additional agency and public comment on the draft management plan. Copies of the finalized management plan must be disseminated to affected and interested parties. Initial review of all management plans must occur after two years and then periodically as needed by the Department. The Department may hold public meetings to assist in evaluation of management plans.

Generic Management Plan

Much of the material contained within this document was taken from the Montana General Agricultural Chemical Ground Water Management Plan (MGACGWMP). The MGACGWMP was subject to development, public participation or comment and review requirements under the Administrative Procedures Act and the Montana Agricultural Chemical Ground Water Protection Act (MACGWPA) requirements, see also Appendix A. In Addition, the Department has sought input and comment from the Department of Environmental Quality (DEQ), Montana Bureau of Mines and Geology (MBMG), Montana and Region VIII Environmental Protection Agency (EPA), Natural Resource Conservation Service (NRCS), United States Geological Survey (USGS), Montana Department of Natural Resources and Conservation (DNRC), Montana State University (MSU) Montana Agricultural Experiment Station (MSU AES) and Montana State University Extension Service (MSU ES) in the development of component 2: Roles and Responsibilities, component 4: Resources, component 5: Assessment and Planning and component 6: Monitoring (specifically DEQ) of the Generic Management Plan. Additionally, these agencies will review the document prior to finalization and publication. It is felt that EPA public participation requirements for the Generic Management Plan have been adequately addressed.

The Generic Management Plan will be disseminated through MDA, DEQ, DNRC, USGS, MBMG, EPA, NRCS, MSU, MSU AES, MSU ES, the State Library and University Library system, Conservation District and Extension offices. The Generic Management Plan will also be mailed to interested parties, will be available upon request from the MDA and will be distributed through both commercial and government applicator training (MDA) and through private applicator training sessions (MSU ES). Additionally, public notice will, potentially, be distributed, through public service announcements, newspaper articles or notices, through the MDA pesticide newsletter and the Montana Agricultural Business Association (MABA) newsletter and through verbal announcement at industry related group and grower association meetings.

Pesticide Specific Management Plans

All SMPs and PSMPs must be adopted as administrative rule, 4.11.301(1), ARM. As such all SMPs and PSMPs will be subject to the development, public participation or comment, and review requirements under the Administrative Procedures Act as well as those outlined in MACGWPA.

Public participation and development of PSMPs will be governed by ARM 4.11.304 and 4.11.306 (MACGWPA) and ARM 1.7.101 (Montana Administrative Procedures Act). ARM 4.11.304 requires that the Department, when developing PSMPs will:

1. Prepare an outline of the PSMP for use at public meetings, which will include a description of the facts and circumstances that led the department to identify the need for a PSMP;
2. Sponsor interagency and public meetings;
3. Consult with local, state and federal agencies, universities and agricultural chemical user groups and the public to identify the provisions; best management plans and practices; information and data needed; and plans for development of the PSMP.
4. Consult with the MSU ES to identify the benefits of appropriate use of the agricultural chemicals within the proposed Specific Management Zone (SMZ) of the PSMP.

Upon completion of these activities, draft PSMP rules will be prepared. The draft PSMP rules will be submitted to DEQ for that Department's review and comment in accordance with ARM 4.11.402. Once DEQ's review is complete and revisions are made as necessary the draft PSMP rules will be noticed into the Montana Administrative Register. Public comment and hearing provisions of Title 2, Chapter 4, MCA will be followed.

Published Pesticide Specific Management Plans will be disseminated through MDA, DEQ, DNRC, USGS, MBMG, EPA, NRCS, MSU, MSU AES, MSU ES, the State Library and University Library system, Conservation District and Extension offices. PSMPs will also be mailed by MDA to interested parties, will be available upon request from the MDA and will be distributed through both commercial and government applicator training (MDA) and through private applicator training sessions (MSU ES). Additionally, the public will be notified through public service announcements, newspaper articles or notices, through the MDA pesticide newsletter and the Montana Agricultural Business Association (MABA) newsletter and through verbal announcement at industry related group and grower association meetings. MDA, in cooperation with MSU ES and other agencies, user groups and the public, will disseminate the PSMP information to chemical user groups and the public. Educational programs to inform agricultural chemical users and other persons on the provisions of the PSMP will be conducted by MSU ES and MDA.

Monitoring and evaluation data will be reviewed by the Core Advisory Group and used to evaluate monitoring under PSMPs and to make changes as necessary. MDA and DEQ continue to share sampling and monitoring data and information, as per the MOU. Dissemination of sampling and monitoring results are outlined in component 8: Response to Detections. Notification of the public may take the form of a public service announcement, public notice by the public water supply,

direct mailings or other forms of communication determined to be the most appropriate and effective means by MDA and DEQ.

In cases where emergency actions are felt to be in the best interest of the public, emergency measures, to be determined by DEQ, MDA and others, including the Department of Health and Human Services, will be implemented. Radio announcements, public TV, public notice signs and newspapers may be used to convey information and provide necessary emergency instructions to the public. Dependent upon the size of the affected area (town and rural district) public notification may also be conducted through door to door contact, a church announcement and/or a local bulletin board or city hall posting. Sampling and monitoring data and information will be published on a bi-annual basis and will be available to the public and will be disseminated to user groups and the public through publications.

PSMPs will be subject to evaluation by the Department periodically to determine whether the program is meeting the objectives of ground water protection. The Department will, in cooperation with the Core Advisory Group members, interested persons, users of agricultural chemicals and the public will develop and use specific evaluation criteria for determining the effectiveness of the PSMP. An initial evaluation will occur two years after first publication and then periodically thereafter. All revisions must comply with the Montana Agricultural Chemical Ground Water Protection Act.

Appendix A
(Component 10)

Public Participation in the Generic Management Plan

The following is a discussion of the public participation involved in the development of the Montana General Agricultural Chemical Ground Water Management Plan (MGACGWMP). The material in the MGACGWMP formed the basis of the Generic Management Plan. For this reason, it is appropriate to discuss the public awareness and participation that was involved in the development of the MGACGWMP.

Public awareness and participation requirements for the MGACGWMP as addressed under the MACGWPA, ARM 4.11.203 were followed. The Department, in cooperation with the DEQ and the Montana State University Extension Service held three meetings concerning the implementation of the Montana Agricultural Chemical Ground Water Protection Act. The purpose of one of the meetings was to seek input from state and federal agencies, agricultural interest groups and environmental interest groups. The intent of the meetings was to obtain comments and recommendations from interested parties on implementation of the act, draft rules and the statewide general agricultural chemical ground water management plan. The following topics were discussed:

- Summary of agency groundwater activities,
- The Montana Agricultural Chemical Ground Water Protection Act (MACGWPA),
- Proposed draft rules for the MACGWPA,
- The Montana General Agricultural Chemical Ground Water Management Plan (MGACGWMP),
- The wellhead protection program,
- Past, present and future activities of MDA, DEQ (then DHES) and MSU ES .

The MDA also held a series of public meetings in Helena, Polson, Whitehall, Billings, Sidney, Havre and Conrad to obtain comments and recommendations from interested parties on implementation of the Act, draft rules and statewide general agricultural chemical ground water management plan.

Comment and recommendations as a result of those meetings were received from the following:

Polson area citizens
Lake County Weed District
Champion Nursery
Montana State University
Charlo area citizens
Whitehall area citizens
Willow Creek area citizens
United States Environmental Protection Agency
Butte area citizens
Meagher Conservation District
Absarokee area citizens
Stillwater County Extension Service
Fromberg area citizens
Billings area citizens
Yellowstone Conservation District
Wilbur Ellis Company
Miles City area citizens
Medicine Lake area citizens
Culbertson area citizens
MT Depart. of Natural Resource Conservation
Natural Resource Conservation Service
Sidney area citizens

Glendive area citizens
Circle area citizens
Eastern Agricultural Research Center
Havre area citizens
Big Sandy area citizens
Montana Bureau of Mines and Geology
Conrad area citizens
Montana Salinity Control Association
Dutton area citizens
Montana Department of State Lands
Montana Department of Environmental Quality
Alternative Energy Resources Organization
Environmental Quality Council
Montana Audubon Council
Northern Plains Resource Council
Montana Wildlife Federation
Clark Fork Coalition
Trout Unlimited
N-Bar Ranch
Montana State University Extension Service
United States Bureau of Reclamation
United States Forest Service
United States Bureau of Indian Affairs
Montana Department of Fish, Wildlife & Parks
Montana Governor's Office
Montana State University
Montana Association of Counties
Montana Association of Agriculture Agents
Women In Farm Economics
Western Environmental Trade Assc. (WETA)
Montana Association of Conservation Districts
Montana Association of Nurserymen
Montana Council of Cooperatives
Montana Grain Elevator Association
Montana Stock Growers Association
Montana Association of State Grazing Districts
Montana Cattle Women's Association
Montana Farm Bureau Federation
Montana Farmer's Union
Montana State Grange
Montana Water Resources Association
Montana Weed Control Association
Greenfield Farmers
Ciba Geigy
Montana Wool Growers Association
Montana Agricultural Trade Assc. (MATA)
MT Environmental Information Center (MEIC)
National Agricultural Chemical Assc. (NACA)
USDA/ASCS
Montana Agricultural Business Association
United States Bureau of Land Management
Montana League of Cities

Information, comments, and recommendations received from the public meetings were used to determine how the management plan was developed, who was involved in its development and the contents of the management plan.

Three MGACGWMP committees were formed; a development and implementation committee, a technical committee and a policy and management committee. The development and implementation committee was responsible for writing and editing the initial draft of the management plan. Each member of the committee was responsible for gathering necessary information, writing portions of the management plan and providing comment and editing for subsequent drafts. The draft was reviewed by the technical committee to determine whether the information contained within the drafted plan was technically and scientifically correct. Changes were made based upon the technical committee's comments and recommendations. The management and policy committee review focused on policy and management aspects of the plan as well as ensuring the document met the intent of the Act.

The following agencies were involved in drafting the MGACGWMP:

Environmental Protection Agency
Montana State University
United States Geological Survey
Montana Department of Agriculture
Natural Resource Conservation Service
Montana Bureau of Mines & Geology
Montana Department of Environmental Quality
Montana Department of Transportation
MT Depart. of Natural Resources & Conservation

The following agencies sat on the technical committee for the MGACGWMP:

Montana Department of Environmental Quality
Montana Department of State Lands
University of Montana
Montana Department of Agriculture
Environmental Quality Council
Montana State library
Natural Resource Conservation Service
MT Environmental Health Association (MEHA)
Montana Agricultural Business Association
Bureau of Land Reclamation
MT Depart. of Natural Resources & Conservation
Montana Department of Highways
United States Geological Survey
Montana Water Resources Association
Montana State University
Montana Department of Fish, Wildlife and Parks
Montana Association of County Extension Agents
United States Fish and Wildlife Service
United States Department of Agriculture
Montana Salinity Control Association
Alternative Energy Resources Organization
Montana Bureau of Mines and Geology

The MGACGWMP Policy and Management committee members were:

Montana Department of Agriculture
Montana Bureau of Mines and Geology
MT Depart. of Natural Resources & Conservation
Montana State University
Intermountain Roundwood Association
Montana Department of Fish, Wildlife and Parks
United States Environmental Protection Agency
Montana County Extension Agents
Montana Association of Nurseryman
Montana Grain Growers Association
Montana Bureau of Reclamation
United States Fish, Wildlife and Parks
Alternative Energy Resources Association
Montana Dairyman's Association
Montana Salinity Control Association
Montana Weed Control Association
Women Involved In Farm Economics
Montana Water Resources
Montana Department of Environmental Quality
Montana Department of State Lands
Montana Department of Highways
United States Department of Agriculture
Environmental Quality Council
Montana State Library
United States Geological Survey
Bureau of Land Management
Bureau of Indian Affairs
Montana Agricultural Business Association
Montana Farm Bureau
Montana Stock Growers Association
Montana Association of County Officials
Montana Environmental Health Association
Western Environmental Trade Association
Montana Grain Elevators Association
Blackfeet Agency
Northern Plains Resource Council
Northern Cheyenne Indian Reservation
Confederated Salish and Kootenai Tribes
Fort Peck Agency

Copies of the MGACGWMP were made available for public review and comment at MDA's Helena office and other publicly accessible locations throughout the state. Public comments were considered and the draft was revised as necessary before submitting the revised draft to DEQ for

comment. No substantive modifications were required following DEQ comment. The document was finalized in 1993 and published in January 1994. As set forth in ARM 4.11.204, the Department, in cooperation with the MSU ES, other agencies, the state library system, user groups and the public disseminated the MGACGWMP to chemical user groups and the public. Copies of the MGACGWMP and sixteen MGACGWMP Fact Sheets are also available upon request from the MDA.

The MGACGWMP is subject to periodic evaluation, 4.11.205, ARM. The initial evaluation will be made after 2 years, followed by additional evaluations as needed. The Department may hold public meetings to assist in evaluation of the MGACGWMP.

Information Dissemination

Generic Management Plan

The Generic Management Plan will be disseminated through the MDA, DEQ, DNRC, USGS, MBMG, EPA, NRCS, MSU, MSU AES, MSU ES, the State Library and University Library system, Conservation District and Extension offices. The Generic Management Plan will also be mailed to interested parties, will be available upon request from the MDA and will be distributed through both commercial and government applicator training (MDA) and through private applicator training sessions (MSU ES). Additionally, awareness of the plan will be accomplished through public notices, public service announcements, news releases, newspaper articles or notices, through the MDA pesticide newsletter and the Montana Agricultural Business Association (MABA) newsletter and through verbal announcement at industry related group and grower association meetings. When updates, changes or revisions are made to the Generic Management Plan, the same process will be used to reach affected users, interested parties and the general public. It is anticipated that changes to the GMP will have a delayed effective date (generally 6 months) to allow for proper dissemination through training and educational endeavors which are held in the spring and fall.

Pesticide Specific Management Plans

Plan Distribution

Once a PSMP has been reviewed and approved by EPA and adopted as state rule, MDA will coordinate dissemination of the PSMP. A PSMP Requirement Fact Sheet will be prepared and disseminated along with the PSMP itself to DEQ; DNRC; USGS; MBMG; NRCS; EPA - Helena Office; MSU; higher education institutions and the State Library; Extension offices; Weed District, Conservation District and NRCS offices in affected areas; trade, grower and industry associations; MDA field staff offices and pesticide registrants and dealers for distribution to the general public, affected individuals and parties or groups. The PSMP Requirement Fact Sheet will be reprinted in the MDA pesticide newsletter, posted on the MDA website, posted to the State Bulletin Board System for retrieval by news media and the general public, and printed in local and area publications (newsletters, newspapers, magazines, etc.). Direct mailings may also be utilized to inform residents of the plan, requirements of plan, how it may affect them and locations where the plan itself may be procured. PSMPs will also be available directly from MDA upon request.

Public Meetings

MDA will work with MSU, MSU ES and Conservation Districts in conducting a series of public meetings within the PSMP area to introduce, describe and explain the PSMP and its requirements. MDA will conduct informational meetings for federal and state agency personnel to introduce management plans in general and to provide detailed information on specific PSMPs and

their requirements. MDA and MSU/MSU AES/ MSU ES staff will be available to address conventions, conferences, seminars and meetings to make presentations, answer questions and address concerns relating to the PSMP and its requirements. Additional public meetings may be held as necessary to inform the public, area residents and pesticide users of plan changes, answer questions and address concerns.

Education and Training

An introduction to the concept and purpose of management plans has been incorporated in the newest publication of the Commercial and Government Pesticide Applicator Basic Manual. Management Plans, in general, and descriptions of existing and pending PSMPs will be provided to individuals attending MDA Initial Certification Training on a yearly basis. MDA and MSU will also incorporate PSMP plan descriptions, explanations and plan requirements into both commercial and government and private pesticide applicator training held each year. Content of such training and educational efforts are described in component 7.

Certified Crop Advisors, described in component 7, are also required to maintain certification standards through a continuing education program on a yearly basis through which information on PSMPs can be relayed. Certified Crop Advisors, in turn, will be able to further disseminate PSMP information through their work with ranchers, farmers and growers.

Registrants and Dealers

Registrants will be asked to play an active role in disseminating information through product stewardship programs. Dealers will also be asked to disseminate information on PSMPs and provide information to pesticide applicators concerning labeling requirements when selling pesticides which are subject to a PSMP.

Pesticide Applicator and Dealer Inspections

Compliance assistance will also be available to commercial and government applicators upon request, providing an additional means of informing pesticide applicators of requirements, revisions, modifications and changes to the plan. PSMP compliance with plan requirements will also become a part of routine inspections.

Information and Data Dissemination

Sampling results will be sent to the well owner or the public water supply manager as outlined in component 8: Response to Detections. Well owners and public water supply managers will be notified verbally by phone if detections are greater than 50% MCL and will be followed up by written notification. Those detections exceeding the MCL or which, at the concentration, represent a health risk through exposure from consumption of the ground water or both will prompt verbal notification followed by written notification and notification of the public. Notification of the public may take the form of a public service announcement, public notice by the public water supply, direct mailings or other form of communication determined to be the most appropriate and effective means by MDA and DEQ. Timing and content of such notifications are more fully addressed in component 8: Response to Detections.

In cases where emergency actions are felt to be in the best interest of the public, emergency measures, to be determined by DEQ, MDA and others, such as the Department of Health and Human Services, will be implemented. Radio announcements, public TV, public notice signs and newspapers may be used to convey information and provide necessary instruction to the public. Dependent upon the size of the affected area (town and rural district) public notification may also be conducted through door to door contact, a church announcement and/or a local bulletin board or city hall posting, direct phone contact and use or registered letters. Sampling and monitoring data and information will published on a bi-annual basis and will be available to the public and will be disseminated to user groups and the public through publications.

PSMP Modification and/or Changes

As a PSMP is evaluated and modified, dissemination of information on changing PSMP requirements will be provided through the above described methods. Administrative changes and minor modifications to the plan will have a 6 month effective delay to allow an appropriate amount of time to adequately disseminate plan modification and revision and changes in plan requirements. Modification and/or changes being made as a result of significant pesticide detections, plan changes involving complex preventive actions or when the public and/or pesticide users have concerns or questions over plan changes may require communicating information involving public health, environmental and compliance issues in a very short period of time. In such cases, public meetings may be held, registered directed mailings sent or direct phone contact may be used. When emergency conditions exist, actions necessary to protect human health and the environment will be taken. Actions may include any of the above described methods or other means deemed appropriate by the Department.

Records and Record Keeping

The MDA will maintain all pesticide records for a PSMP a minimum of four years. This requirement will be applied to any records concerning the development and implementation of a PSMP. Such records will include commercial and government pesticide applicator records, permits and individual plans, information and data on sampling and monitoring conducted, results of analyses, types and numbers of enforcement actions taken, records of any site-specific regulatory actions and administrative actions taken. Except for records relative to a specific agency's functions, PSMP records will be maintained by the MDA. Data on monitoring results will be maintained both by the agency conducting the monitoring (i.e., MDA, DEQ, USGS, EPA) and will also be entered in the Ground Water Information Center (GWIC) database maintained by MBMG. Enforcement files will be maintained by the responsible agency and will be made available to the public and government agencies subject to confidentiality requirements.

All data records will be public record in accordance with Title 80-8-107, MCA and will be reported to the EPA in accordance with schedules for reporting contained in the Generic Management Plan, or at other times with reasonable notice. Records will be available for public inspection as required by State Public Records Law.

For a PSMP, the State shall prepare and submit to the regional EPA office annual and biennial reports on the status and progress of the plan. These reports shall be compiled and prepared by the State Liaison Officer (see Component 2, Roles), and will include both a programmatic and environmental evaluation. The following information will be include in these records:

Programmatic

- Discussion of the accomplishments and progress relative to the 12 components in implementing the PSMP,
- Identification of special PSMP issues within the state, i.e., changes in resources or authority,
- Biannual budget projections for PSMP activities including both state appropriations and federal grant funding requests,
- Description of, including a time table for, any proposed PSMP modifications or revisions,
- A summary PSMP compliance activity report which will include the number of compliance inspections performed, number of investigations performed, investigative results, description of the types and number of completed PSMP noncompliance enforcement actions,
- A summary of the actions taken in response to detection of pesticides in ground water,
- Other data and reports as mutually agreed to by the State and EPA.

Environmental

- Results and analyses of ground water sampling and monitoring,
- Summary of significant ground water sampling and monitoring which would prompt the State to make changes in management intensity or modify the PSMP,
- Assessment of pesticide usage; has the use increased, decreased or remained the same over time,
- Report significant findings which require movement to more intensive (restrictive) pesticide management,
- Other data and reports as mutually agreed to by the State and EPA.

Prior to submittal of the report to EPA, a draft report will be provided to PSMP cooperating agencies for review and written comment. Although there is no federal requirement for reporting of PSMP actions under FIFRA and CWA grant funding awards, the State will discuss important management plan issues during mid-year and end-of-year grant reviews by EPA.

In addition the State, through the liaison officer, will notify EPA as soon as possible of any significant changes under a PSMP, including significant monitoring and compliance program results.

Acronyms

AERO	Alternative Energy Resources Organization
AES	Agricultural Experiment Stations
ARM	Administrative Rules of Montana
ARS	Agricultural Research Service of USDA
ASD	Agricultural Sciences Division of the MDA
BIA	United States Bureau of Indian Affairs
BLM	United States Bureau of Land Management
BLR	United States Bureau of Land Reclamation
BMP	Best Management Plan/Practice
CCA	Certified Crop Advisor
CD	Montana Conservation District
CECRA	Montana Comprehensive Environmental Cleanup and Responsibility Act
CERCLA	United States Comprehensive Environmental Response Compensation and Liability Act
CMIS	Chemical Migration in Soils
CRA	United States Conservation and Recovery Act
CRP	United States Conservation Reserve Program
CWA	United States Clean Water Act
DEQ	Montana Department of Environmental Quality (formerly the Montana Department of Health and Environmental Sciences - DHES)
DHES	Montana Department of Health and Environmental Sciences (now DEQ)
DNRC	Montana Department of Natural Resources and Conservation
DOT	Montana Department of Transportation
DSL	Montana Department of State Lands
EIS	Environmental Impact Statement
EPA	United States Environmental Protection Agency
EPA GMP	Environmental Protection Agency Generic Management Plan
EQC	Environmental Quality Council
FACT	The United States Food, Agriculture, Conservation and Trade Act
FARM*A*SYST	Montana Farmstead Assessment System
FFDCA	Federal Food, Drug and Cosmetic Act
FGWMP	Fertilizer Ground Water Management Plan
FIFRA	Federal Insecticide, Fungicide and Rodenticide Act
FQPA	Food Quality Protection Act
FTE	Full Time Equivalent (Employees)
FSB	Field Services Bureau, of the MDA

FY	Fiscal Year
GIS	Geographical Information System
GLEAMS	Ground Water Loading Effects of Agricultural Management Systems
GMP	General Ground Water Management Plan (State of Montana)
GWIC	Ground Water Information Center
GWSI	Ground-Water Site Inventory
HA	Health Advisory
HAL	Health Advisory Level
I	Impacted waters classification for surface water which does not allow any increase of contaminants
ICPM	Integrated Crop and Pest Management
INS	Interim Numerical Standard
IPM	Integrated Pest Management
K_{oc}	Soil Adsorption Potential
LB	Laboratory Bureau of the MDA
LEACHMP	Leaching Model for Pesticides
MABA	Montana Agricultural Business Assoication
MACGWPA	Montana Agricultural Chemical Ground Water Management Act
MATA	Montana Aviation Trades Association
MBMG	Montana Bureau of Mines and Geology
MCA	Montana Code Annotated
MCL	Maximum Contaminant Level
MDA	Montana Department of Agriculture
MDFWP	Montana Department of Fish, Wildlife, and Parks
MDL	Method Detection Limit
MEHA	Montana Environmental Health Association
MEIC	Montana Environmental Information Center
MFB	Montana Farm Bureau
MFU	Montana Farmers Union
MGACGWMP	Montana General Agricultural Chemical Ground Water Management Plan
MGGA	Montana Grain Growers Association
MOU	Memorandum of Understanding
MPA	Montana Pesticide Act
MSCA	Montana Salinity Control Association
MSL	Mean Sea Level
MSL	Montana State Library
MSU	Montana State University
MSU AES	Montana State University Agricultural Experiment Station

MSU ES	Montana State University Extension Service
MSWMA	Montana Solid Waste Management Act
MT GMP	Montana General Management Plan, see MGACGWMP
MWQA	Montana Water Quality Act
MWUA	Montana Water Use Act
NACA	National Agricultural Chemical Association
NRCS	Natural Resource Conservation Service (formerly SCS)
NPDES	National Pollution Discharge Elimination System
NPS	Nonpoint Source Program
NRIS	Natural Resources Information System
NWIS	National Water Information System
ORW	Outstanding Resource Water
PPD	Pesticide Properties Database
PRZM	Pesticide Root Zone Model
PSMP	Pesticide Specific State Management Plan (EPA)
PWS	Public Water Supply
QA/QC	Quality Assurance/Quality Control
QAPP	Quality Assurance Project Plan
QWDATA	Water Quality Data Processing System
RAVE	Relative Aquifer Vulnerability Evaluation
RCRA	United States Resource Conservation and Recovery Act
S	Water Solubility
SARA	The United States Superfund Amendments and Reauthorization Act
SCS	United States Soil Conservation Service
SDWA	United States Safe Drinking Water Act
SHWB	Solid and Hazardous Waste Bureau of the MT DEQ (see WMD)
SMP	Specific Ground Water Management Plan (State of Montana)
SMZ	Specific Management Zone (State of Montana)
SOC	Synthethic Organic Chemical
SOP	Standard Operating Procedure
STATSGO	State Soil Geographic Database
STORET	Storage and Retrieval System
SDWA	Safe Drinking Water Act
SWUDS	State Water Use Data System
$T_{1/2}$	Pesticide Half-Life in Soil
TSB	Technical Services Bureau, of the MDA
TSCA	The United States Toxic Substances Control Act of 1976
UM	University of Montana

USC	United States Code
USDA-ARS	United States Department of Agriculture- Agriculture Research Service
USGS	United States Geological Survey
VOC	Volatile Organic Chemical
WETA	Western Environmental Trade Association
WIFE	Women In Farm Economics
WIS	Water Information System